NOVEMBER 13, 1961

PAPER TRADE JOURNAL

Potlatch Leads Way With First Computer on a Paper Machine

How Fibreboard Uses Stevens Formers to Make Better Board

Versatility is Prime Requirement of Equipment for Coating Prep

Details on Hot Stock Screening Revealed to Alkaline Pulpers

Contents of the Week, pages 4-5

University Microfilms, Inc.
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Ann Arbor, Mich.

Paper sculpture by Giuseppe Baggi

Pulp from Gottesman means...

TECHNICAL SERVICE!

Bleached and Unbleached Sulphite • Bleached Hardwood • Groundwood
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Established 1886

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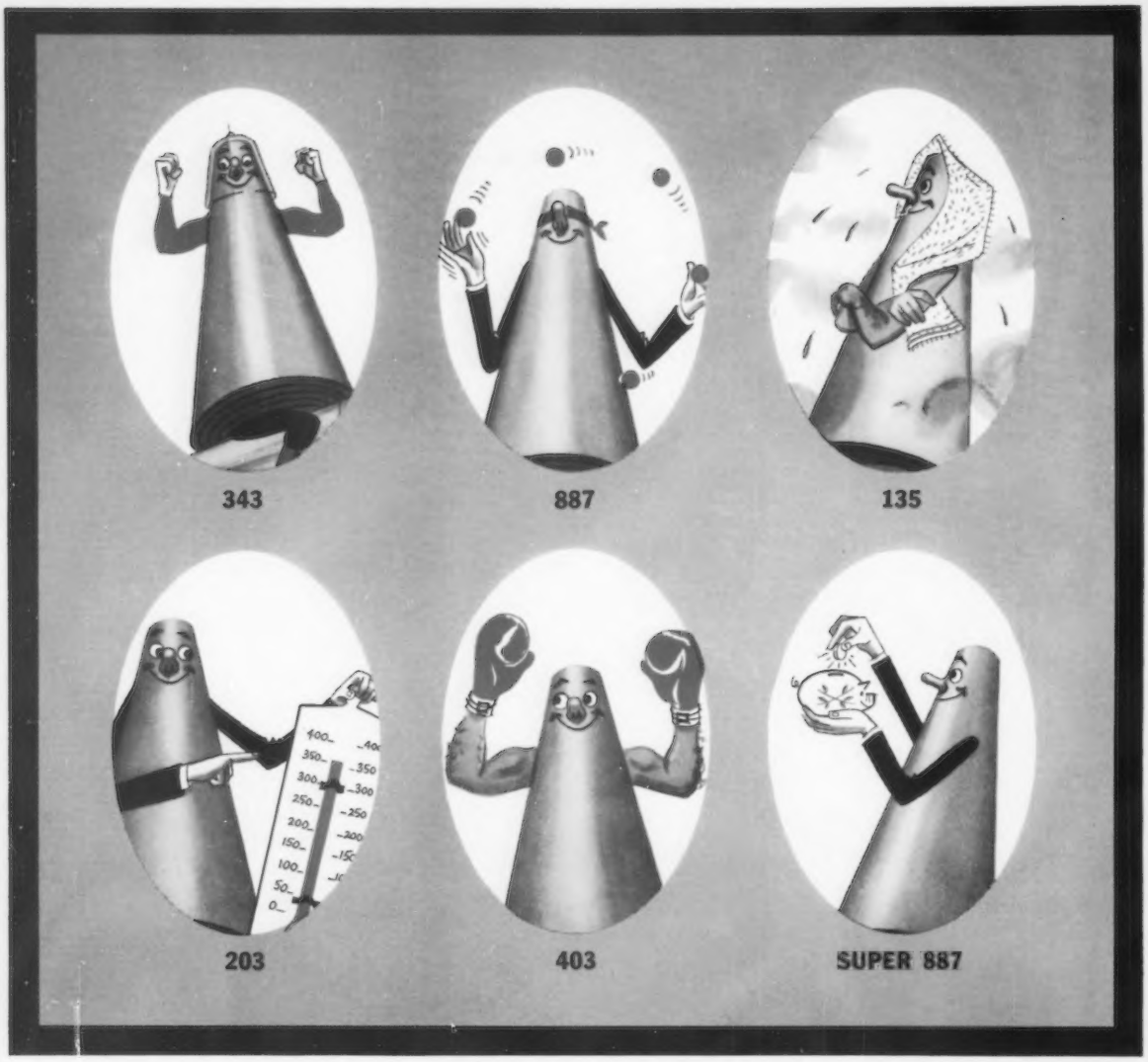
Gottesman & Company, Inc. • Central National Corporation

PULP PAPER WOOD



THIS GIFTED FAMILY OF MOUNT VERNON DRYER FELTS
GIVES YOU THE ANSWER TO EVERY DRYER FELT REQUIREMENT

Whatever your dryer felt need, for whatever the paper-machine position . . . you can count on one of our MOUNT VERNON Dryer Felts to answer your purpose . . . and you can count on our trained staff of MOUNT VERNON engineers to help solve any of your dryer felt problems. This wide range of superior felts has been designed to do the job better, stay on the job longer and to aid in the making of finer qualities of paper. We will be glad to discuss your requirements with you and to recommend the dryer felt in the MOUNT VERNON family that we believe is best suited to your needs.

SIAMESE 135 – All-cotton duplex dryer felt with exceptionally smooth face. An old reliable for positions where maximum porosity and efficient drying are needed.

WOODBERRY 887 – Medium weight cotton dryer felt with asbestos yarns in the face to provide greater resistance to heat. Recommended for a wide variety of drying applications.

WOODBERRY 403 – Synthetically reinforced, full-faced asbestos dryer felt. Designed to yield long life and maximum drying efficiency in the hottest positions.

RICHLAND 343 – Synthetic reinforced cotton dryer felt. Engineered to endure longer runs where real wear-resistance is needed.

WOODBERRY SUPER 887 – Combination of asbestos and synthetic fibers give this felt potential for running in many positions where more expensive combinations are currently being used.

WOODBERRY 203 – Heavy-weight, full-faced asbestos dryer felt. Provides extra strength where heat-resistant clothing is required.

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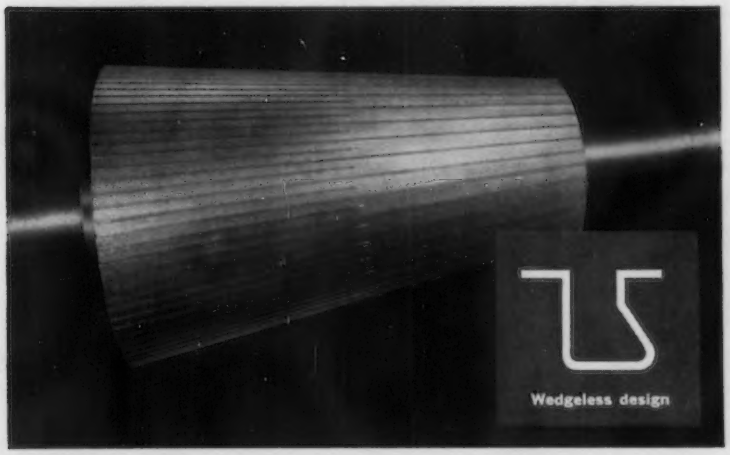
ONLY EMERSON WEDGELESS PLUGS CAN PASS THIS TEST

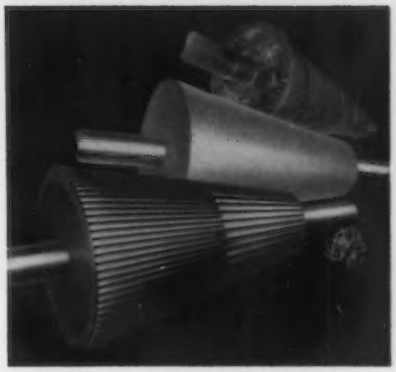
- because only Emerson Plugs have these design advantages!

Before You Buy Another Jordan Plug Check the Answers to these Questions

Question	Emerson Wedgeless Plugs	Other Plugs
Are plugs available in stainless steel?	YES	NO
Are plugs easy to strip and fill because of bandless construction and only one knife to a slot?	YES	NO
Can a full range of knives — both single and duplex — be used interchangeably in the same plug?	YES	NO
Does the design provide impact cushions between the base of the knives and the bottom of the slots?	YES	NO
Is there ¾" of wear depth available on all knives for long periods of Jordaning?	YES	NO
Can used plugs be jacketed with stainless steel?	YES	NO
Do bars have the advantage of Microlyzing based upon 40 years experience in custom heat treating?	YES	NO

These exclusive features are found *only* in Emerson Wedgeless Plugs. In addition, the unique design of Emerson Plugs gives you precision milled, equally-spaced slots so that when the plug is filled, *all* stock gets thorough, uniform treatment over the entire plug surface. Metal-to-metal contact in the slots adds strength and supports the knives their entire length.





Hundreds of mills have gained the advantages of Wedgeless Plug design by having their used plugs jacketed with Stainless Steel through Emerson's patented process.

DURABILITY UNMATCHED

When it comes to wear resistance and durability, try matching the high tensile strength of materials used in Wedgeless Plugs with those of other plugs: Special Stainless Steel — 125,000; Fabricated Steel — 75,000; Cast Iron — 57,500. For additional plug strength, a hammered forged steel shaft is pressed into the Emerson plug body under 60-ton hydraulic pressure. No wonder Emerson Wedgeless Plugs are stronger — more durable and serviceable than any other plugs — and specified by more papermakers.

Over thirty years ago Emerson Wedgeless led the field in Jordan plug design. It still leads today. It has never been equalled. Use Emerson Wedgeless Plugs. Buy the best. Save money, time and trouble. You have a choice of cast or fabricated plugs . . . Stainless Steel Jacket on Cast Steel body . . . Stainless Steel Jacket mounted on your old plug. *And remember, of the hundreds of used plugs jacketed with stainless steel,* ***not one has ever failed in service.*** For full information, write.

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The Emerson Manufacturing Co.
Division of John W. Bolton & Sons, Inc.
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PAPER TRADE JOURNAL

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FEATURED THIS WEEK

First Computer Application On a Paper Machine

An on-the-spot report of this interesting new but still experimental installation at Potlatch Forest Industries, Lewiston, Idaho. **35**

Stevens Formers Improve Top Liner on Multi-Cylinder Board Machine

Fibreboard utilizes two Stevens Formers together with six conventional cylinders on a machine producing folding boxboard. The units have shown to advantage in both economics and quality. Details are discussed here. **38**

Coating Demands Versatility in Handling and Preparation Equipment

The variety of coating requirements and the need to keep pace with new developments call for a versatile system—William G. Farin **40**

Hot Stock Screening Examined In Depth By Alkaline Pulpers

Caustic cookers convene in cow country (Houston, Texas) and give black stock screening the spotlight, hear about new controls methods, pulping of outside stored chips, many other topics. An extra session on sulphite pulping was included—Harry Dyer **45**

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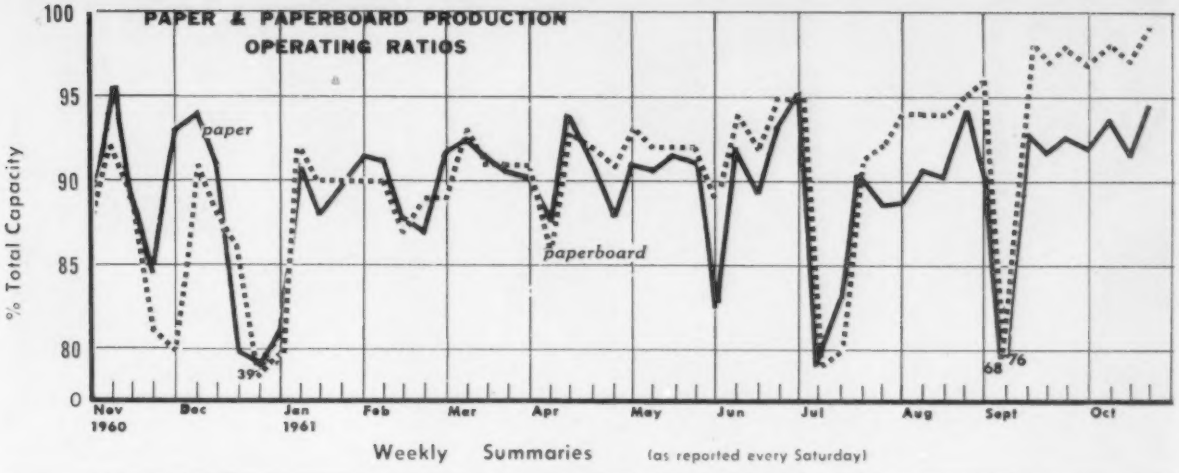

NEWS OF THE WEEK

Hammermill Obtains Control of Strathmore . . . C. F. P. to Add Continuous Digester at Howe Sound . . . Bowater-Scott to Form Danish Affiliate . . . U. S. Paper Mill Machinery Exports Jump $3 Million .....

O'Donoghue Promoted At Riegel Paper . . . CCA Names Drnec Manager, Solid Fiber Sales . . . Eastex Appoints Brown a Vice President . . . Strathmore Announces Three Promotions . . . Ashby Returns to B. C. Offices of Westminster .....

Westab to Purchase Montag for Cash . . . KVP Sutherland Sells Albany, Ga., Plant . . . Southern Envelope Opens Branch Plant . . . Weyerhaeuser Moves Horn To Olympic, Wash., Plant . . . Georgia-Pacific Names Supt. for Toledo Plant . . . American Can Appoints Milk Container R&D Manager

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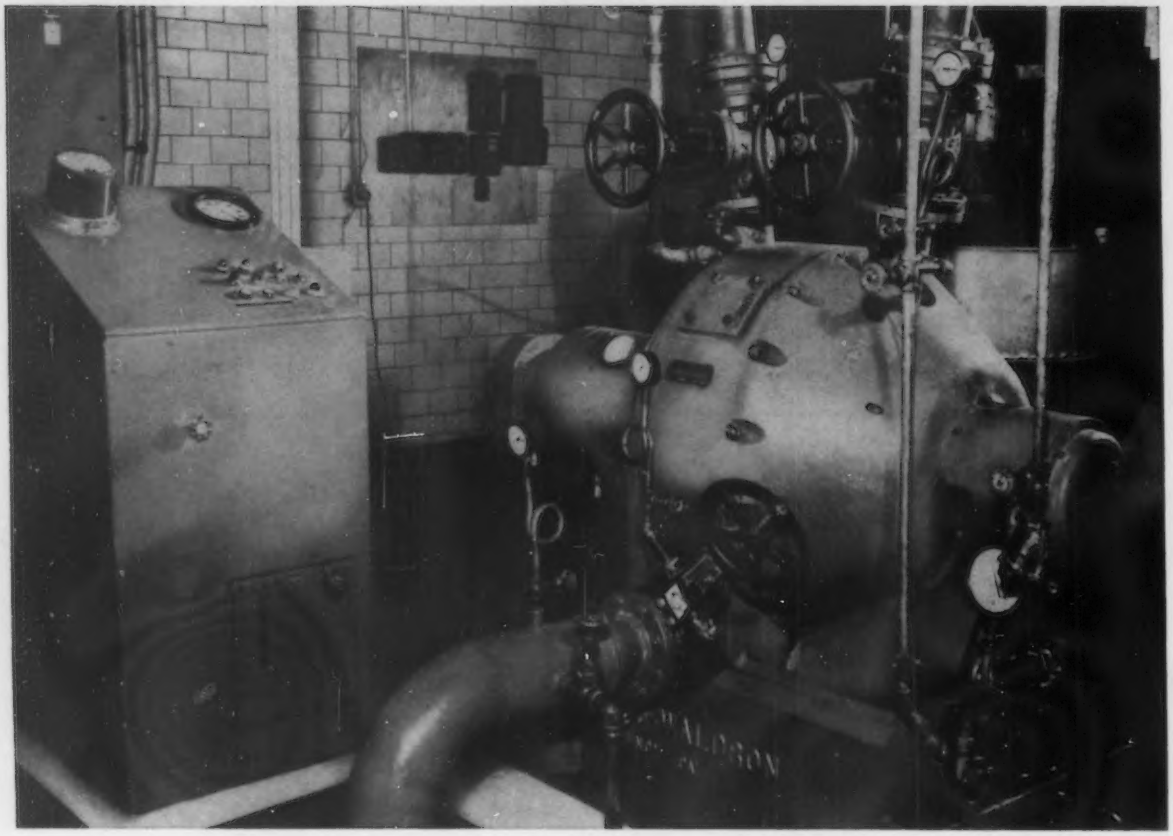
REMEMBER THESE DATES

CPPA Technical Section, Annual Meeting, Queen Elizabeth Hotel, Montreal, Canada

JANUARY 22-26

Paper Week, New York City

FEBRUARY 19-22



AT CONTAINER CORPORATION OF AMERICA

SPROUT PRESSURIZED REFINER

gives twice the normal capacity in a single unit

At CCA, Sprout-Waldron's Pressurized Refiner gives *twice the normal capacity in a single unit.* The parallel feed arrangement serves twin refining surfaces, providing twice the capacity of single disc units of equal disc diameter.

Superior quality control results from the unique FLOATING ROTOR which allows you to change throughput *or* capacity with the simple adjustment of the stock flow control valve at the refiner discharge.

Tedious, time consuming refiner *readjustments are virtually eliminated* since pumping action of the Sprout Pressurized Refiner gives the same approximate "unit work" with changes in throughput. This is not the case with single disc pressurized refiners where the entire back of the refining disc is subjected to the refiner discharge pressure which results in an increase or decrease in "unit work" with a decrease or increase in refiner throughput.

If you are looking for mechanical simplicity, high production and uniform quality *plus* low operating and maintenance costs, get the facts on Sprout-Waldron 20", 26", 34" and 42" Pressurized Refiners. *Bulletins are available upon request.*

SPROUT, WALDRON & CO., INC.

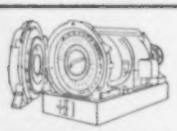
MUNCY, PENNSYLVANIA, U. S. A.

Refiners • Conveyors • Feeders • Screens • Mixers • Driers • Stock Proportioners

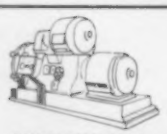
609

SW SINCE 1866

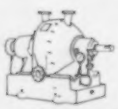
MORE SPROUT DISC REFINERS ARE SOLD THAN ANY OTHER MAKE

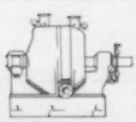


36-1 • REFINERS • 36-2

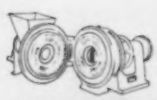


DOUBLE DISC REFINERS





20"-26" • PRESSURIZED REFINERS • 34"-42"



LABORATORY REFINERS

. . . in each case . . . a

modern Appleton Stack

with components to suit specific supercalendering requirements

The Mead Corporation
Chillicothe, Ohio
publication grades

Customers have come to know the Appleton approach to building Supercalenders is an art — a fine art that begins with thorough research — culminates in the push-button startup in their mills. In between these first and final steps, go hours of engineering design, machining to pin-point accuracy, expert fabrication, and complete checkout. The result is a solid, integrated stack built to work day-in, day-out at the speed our customer requires. To do this, Appleton provides him with a ruggedly constructed, custom-built unit designed to produce a quality product he can be proud to market.

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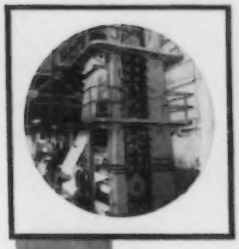
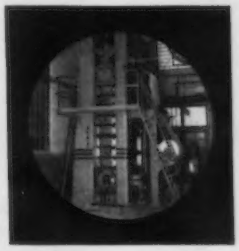
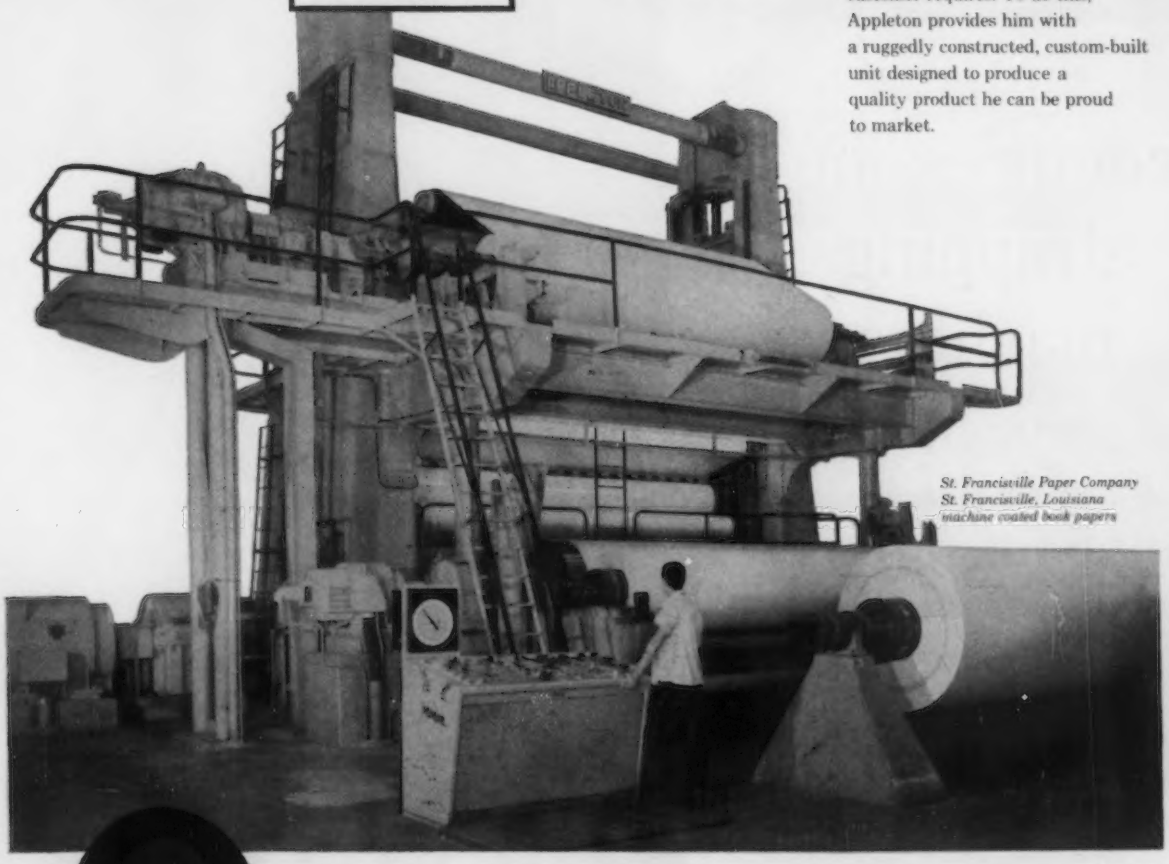
Muskegon, Michigan
off-machine coated

Nicolet Paper Corporation
West DePere, Wisconsin
glassine





Badger Paper Mills, Inc.
Peshtigo, Wisconsin
waxing stock



St. Francisville Paper Company
St. Francisville, Louisiana
machine coated book papers

let our supercalendering specialists meet with you to discuss your particular needs . . .

APPLETON MACHINE COMPANY

APPLETON, WISCONSIN

Six questions
to

embarrass

any
compression
strapping
machine
salesman

(except ours)

1 **How big is the press?**
The effective upper platen width on the Acme Steel E50 Strapping Press is a full 76″. And there's a full 65″ front to back in the lower platen.

2 **How many ways can I feed straps?**
Acme Steel designed the E50 for feeding front to back by power and/or hand. One or more powered strap feed units and tracks can be placed at predetermined locations. Or, you can hand feed to apply strap on a 4″ cleat at any location.

3 **Can I run flat bottom units, double faced pallets and narrow skids into and through your machine?**
The E50 Strapping Press permits unobstructed flow of all type units. It even handles small skids with space as little as 16″ between runners.

4 **What height skids will your machine handle?**
The E50 has a full platen opening for skids 30″ to 86″ high. What's more, the standard upper platen grid provides proper pressure on narrow cleats and close spacings in both directions.

5 **Can I strap in any pattern?**
The Acme Steel feed system and construction of the upper platen gives you maximum flexibility. You can place straps in both directions for all size skids.

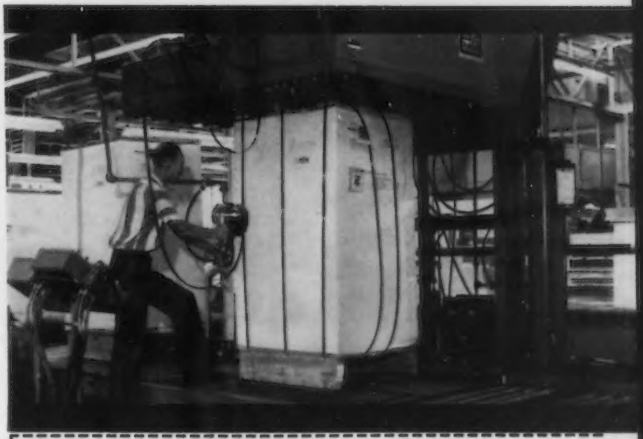
6 **How do I properly align conveyorized skids to power feed strap through notches in runners?**
The Acme Steel system for conveyorized wrapping and compression strapping skids of paper utilizes a special inexpensive conveyor. It positions the skid so strap can be power fed quickly and smoothly.

Get all the frustrating facts!

Call your Acme Idea Man, or return the coupon, for full details on the Acme Steel E50 conveyorized wrapping and compression strapping station. It's made by the people who pioneered and perfected compression strapping for the paper products industry. It's the machine that incorporates the experience of over 200 successful installations throughout industry—all Acme Steel, of course.

ACME STEEL

IDEA LEADER IN **STRAPPING**



Acme Steel Products Division, ACME STEEL COMPANY
Dept. PJS-111A, 135th Street & Perry Avenue, Chicago 27

☐ Please send full details on the features that have made the E50 Strapping Press the most successful wrapping and compression strapping machine in the field.
☐ Have Acme Idea Man call.

Name_____

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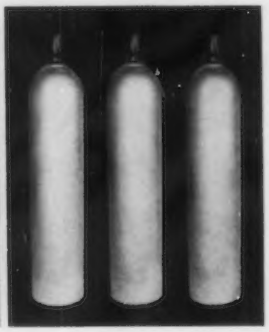
Diamond delivers the Chlorine

by inland waterway...by the bargeload

by tank cars...or by the cylinder or container

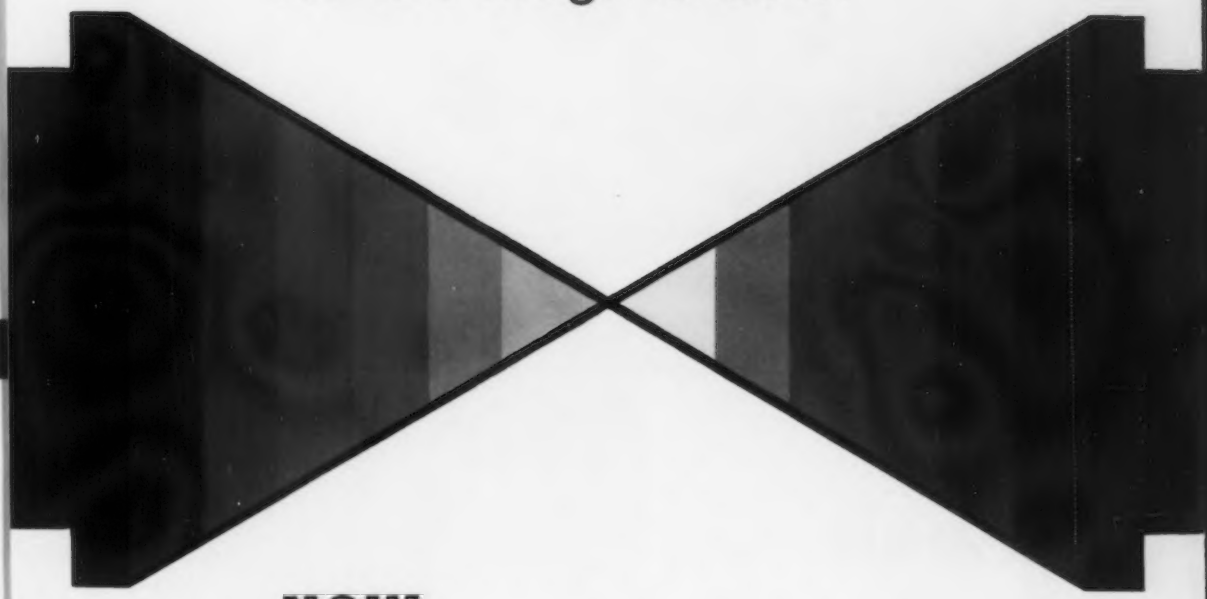


It doesn't matter how great your requirements or how small—DIAMOND delivers liquid chlorine to you at the lowest possible cost from four strategically located plants.

What's more, it's a safe delivery—and a uniform one. DIAMOND has its own producing plants, research and development laboratories, and its own shipping containers. DIAMOND offers trained technical assistance to advise on the economical use of chlorine. For the DIAMOND "Chlorine Handbook", write DIAMOND ALKALI COMPANY, 300 UNION COMMERCE BLDG., CLEVELAND 14, O.

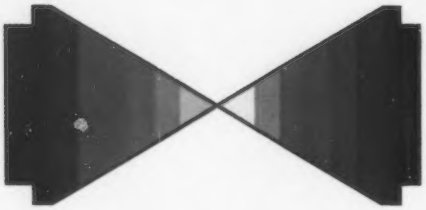
Diamond Chemicals

Some valves are designed
for the easy services...
the others,
for the tough ones...



NOW,
ROCKWELL HAS DEVELOPED
AN EXCITING, NEW
CONCEPT THAT
SPANS THE SPECTRUM
OF VALVE SERVICES

THE NEW ROCKWELL



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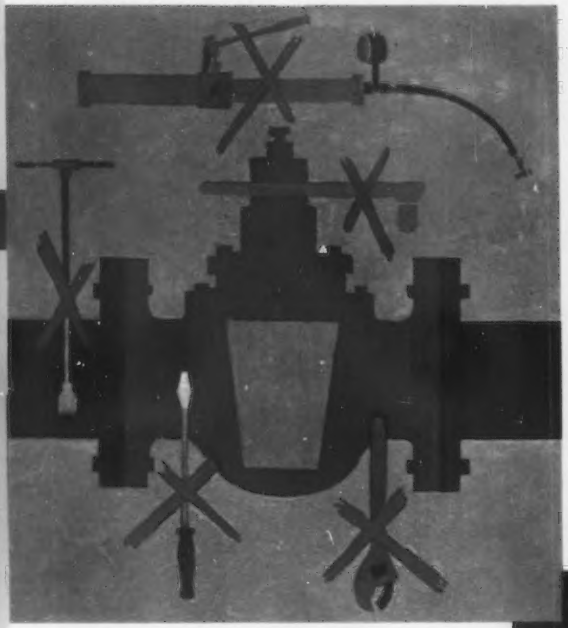

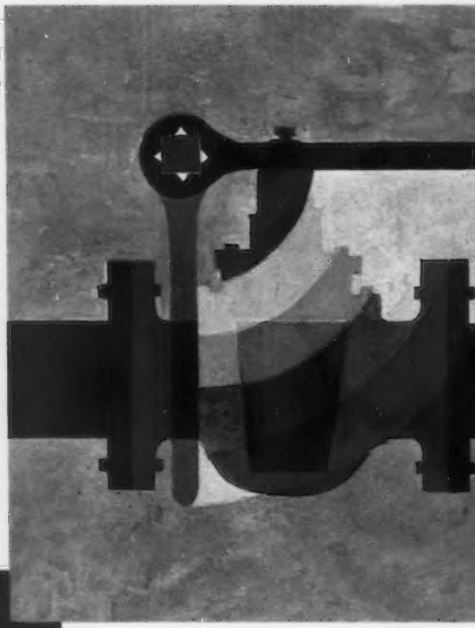

Attention-Free Performance

Some valve users put a premium on a valve that can be installed and forgotten —that needs no attention. For many non-critical services, this kind of valve is adequate: the new Rockwell PERMATURN valves can be used in such services with no attention—and with excellent results.

Easy 90°-Turn Operation

Fast opening and closing are easier the new Rockwell PERMATURN than any other valve ever developed. Ju quick, smooth quarter-turn from full-o to shut-off, and this unique valve de assures low-torque operation alway that's where the name PERMATU comes from!

LIFT THESE PAGES for more information on this exciting new

. PERMATURN® VALVE DESIGN!

one valve, you get all the features needed
satile application to any fluid control service

sier with
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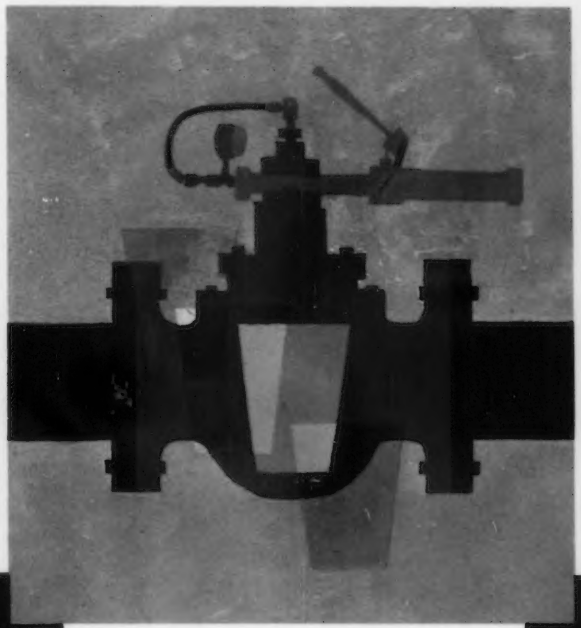
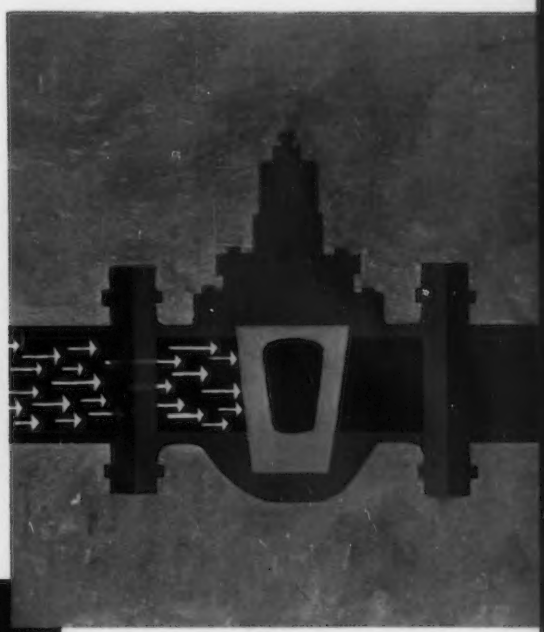
lways—
ATURN



Push-Button Seat Replacement

Here's a feature you'll find in no other type valve: you can put a new seating surface in the new PERMATURN valve in seconds, *without loosening a single bolt.* You can replace valve seats as often as you like—no more putting up with leaky valves. You add years of life—and save money—with this performance-extending feature of PERMATURN valves.



Drop-Tight Sealing

There are some valve applications where there's just no substitute for the bottle-tight, wear-defying characteristics of the new Rockwell PERMATURN valve used with a *regular program of sealant replacement.* And in these critical services, the PERMATURN valve has dramatically reduced operating torque requirements.

new valve line!

THE NEW ROCKWEL

available in all si

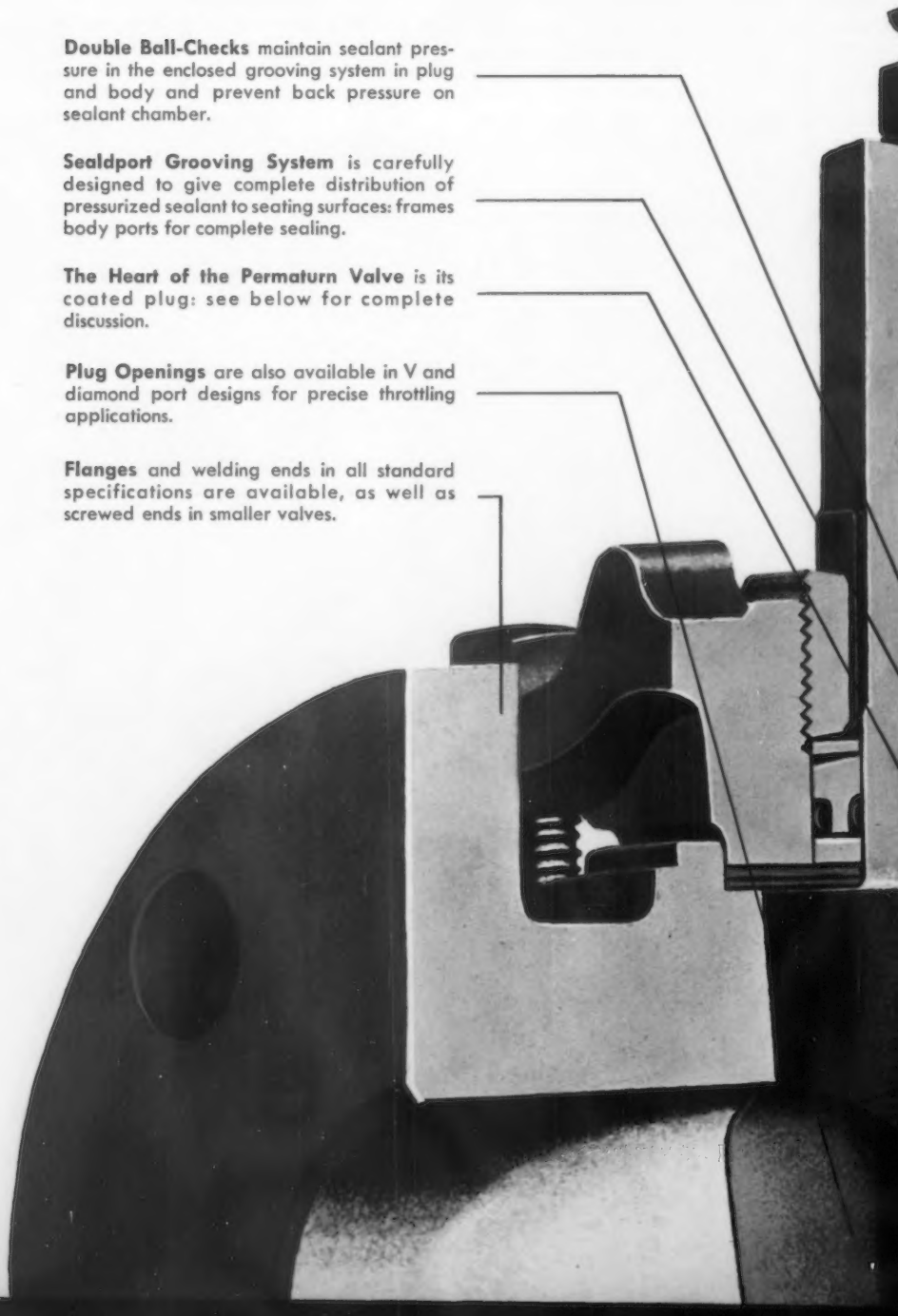
Double Ball-Checks maintain sealant pressure in the enclosed grooving system in plug and body and prevent back pressure on sealant chamber.

Sealdport Grooving System is carefully designed to give complete distribution of pressurized sealant to seating surfaces: frames body ports for complete sealing.

The Heart of the Permaturn Valve is its coated plug: see below for complete discussion.

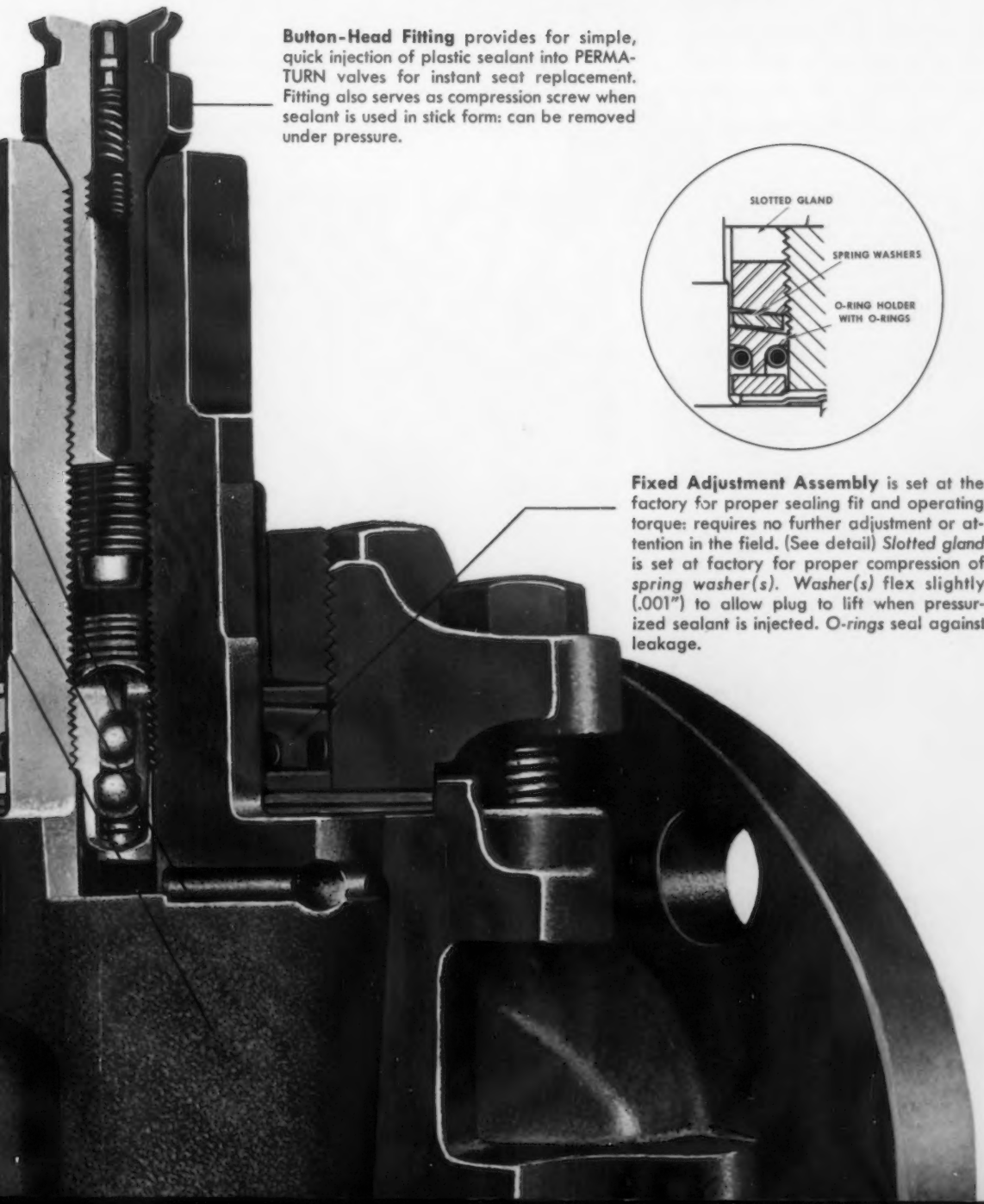
Plug Openings are also available in V and diamond port designs for precise throttling applications.

Flanges and welding ends in all standard specifications are available, as well as screwed ends in smaller valves.



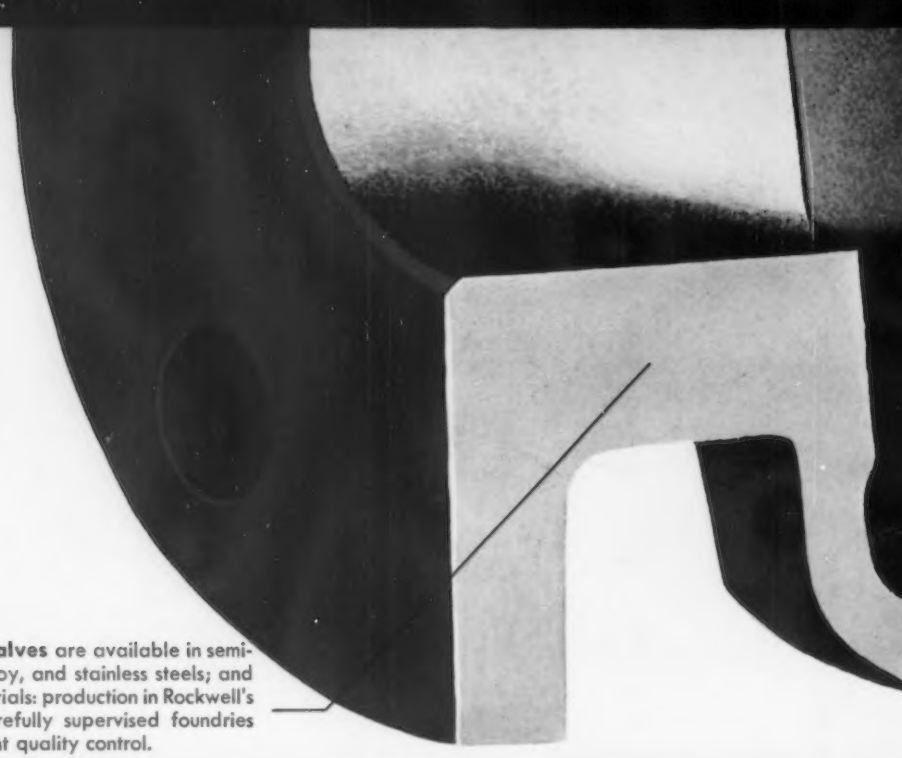
LL PERMATURN® VALVES

sizes for all pressures

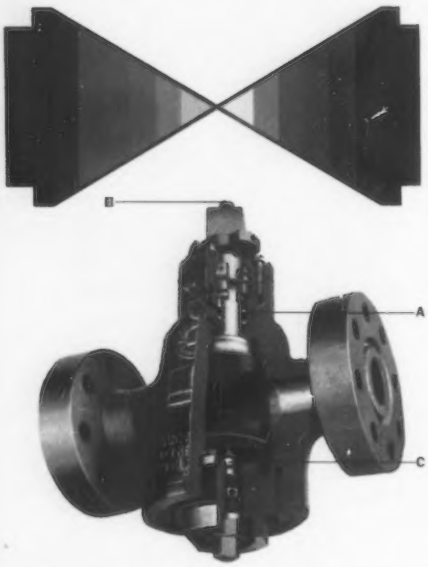


Button-Head Fitting provides for simple, quick injection of plastic sealant into PERMA-TURN valves for instant seat replacement. Fitting also serves as compression screw when sealant is used in stick form: can be removed under pressure.

Fixed Adjustment Assembly is set at the factory for proper sealing fit and operating torque: requires no further adjustment or attention in the field. (See detail) *Slotted gland* is set at factory for proper compression of *spring washer(s)*. *Washer(s)* flex slightly (.001") to allow plug to lift when pressurized sealant is injected. *O-rings* seal against leakage.



PERMATURN Valves are available in semi-steel; carbon, alloy, and stainless steels; and non-ferrous materials: production in Rockwell's own modern, carefully supervised foundries provides excellent quality control.



Rockwell PERMATURN valves are also available in the inverted plug Hypreseal® design for high pressures. Low torque operation is assured by plug coating of high lubricity and bearing-guided stem. Other features are plastic stem sealing (A), fitting for "push-button" seat replacement (B), and thrust assembly (C) for controlled plug adjustment.

The secret of t

PERMATURN® valv

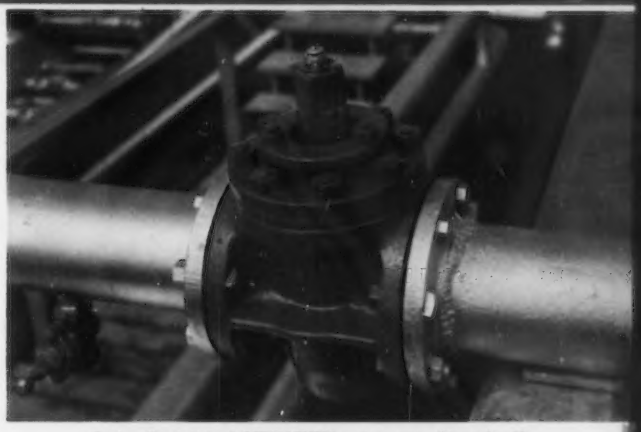
The unique design feature that makes the Rockwell PERMATURN valve line applicable to all valve services is its coated plug.

Developed after five years of extensive testing, the coating has an extremely low coefficient of friction and is applied in such a way that it is *permanently bonded to the metal surface of the plug*. This tenacious lubricating film gives *permanent separation of metal surfaces* of plug and body: the valves literally cannot stick or freeze.

The inert nature of the plug coating assures permanent lubricity for easy, sure operation of the PERMATURN valve at all times. Combined with the many other new design features described above,

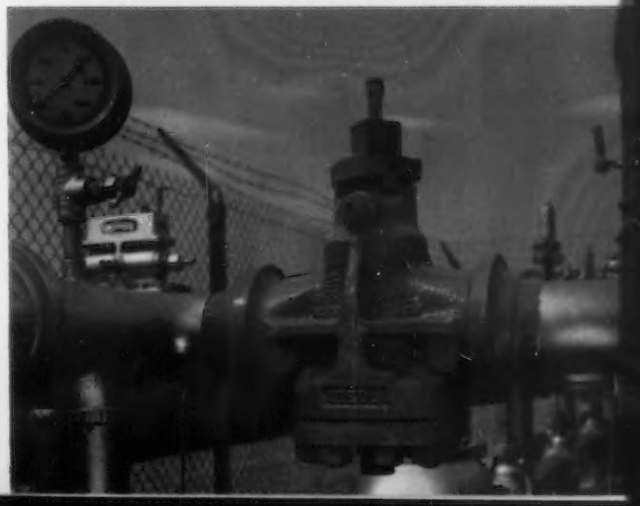
Structural Design of the PERMATURN valve is the strongest of any valve available today: body ribbing gives complete freedom from distortion at rated pressures and temperatures.

the Rockwell
lve's versatility...



Rockwell semi-steel PERMATURN valves are shipped with a distinctive red primer paint that has wide compatibility.

Steel PERMATURN valves are given a gray prime coat: both colors give good corrosion-protection in storage and in service.



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the plug coatings give the Rockwell PERMATURN valve these versatile application benefits:

Attention-Free Performance in services where fluids handled do not require a special valve.

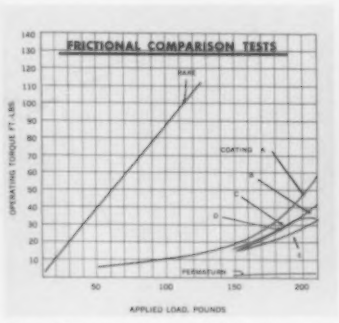
Easy, 90°-Turn Operation in all valve services, even where remote operation or infrequent attention are involved.

"Push-Button" Seat Replacement extending valve usefulness without costly downtime and maintenance.

Drop-Tight Sealing for critical applications where this feature is all-important.

Only Rockwell, world leader in valve research, could have developed the PERMATURN® valve

For more than forty years, Rockwell has pioneered in valve research. This background of experience, which made the Rockwell-Nordstrom lubricated plug valve the world's standard of quality, led to the five year development program on the PERMATURN valve, a new concept in versatile, all-purpose valve design.



Part of this study concerned the various characteristics of many compounds considered for the plug coating medium. Exhaustive mechanical and chemical resistance tests, and carefully measured frictional comparisons, led to the selection of a material which has proved its ability to stand up under tough service for years of normal valve operation.

Complete production facilities for the new PERMATURN valve have been installed at Rockwell's nationwide valve manufacturing plants. The equipment shown above was specially developed to coat the plugs of Rockwell PERMATURN valves on a production line basis and is typical of installations at other Rockwell plants.

Rockwell PERMATURN® valves have been customer-proved before introduction

NO ATTENTION has been given these Rockwell PERMATURN valves on hydrocarbon service in the year and a half since their installation. Operation is positive and easy—and shut-off is still as bottle-tight as the day the valves were installed.

JET FUEL is handled by these Rockwell PERMATURN valves, in service since 1960. Operators have found the plug coating of PERMATURN valves gives smooth, easy operation—and has reduced sealant injection needs from once-a-week to once every three months.

SURE OPERATION on tough services has been proved by pilot installations of PERMATURN valves across the country. The coated plug supplements a regular program of sealant replacement, needed in these services for long valve life, to assure low-torque operation at all times.

Rockwell Manufacturing Company
Pittsburgh 8, Pennsylvania

I'd like to have your "Pocket Valve Guide" with brief specs and coverage charts on Rockwell PERMATURN valves.

Name_____ Title_____

Firm_____

Address_____

City_____ Zone_____ State_____

ROCKWELL PERMATURN VALVES
another fine product by
ROCKWELL

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That's what papermakers tell us about the new Horse Head A-440 anatase titanium dioxide. Its low viscosity permits the production of free-flowing coating colors of high solids content with a minimum of dispersant. This tailor-made titanium dioxide is free of agglomerates to give quick and complete dispersion — to reduce mixing time.

Horse Head A-440 will enable you to make better coating colors — faster — with production savings.

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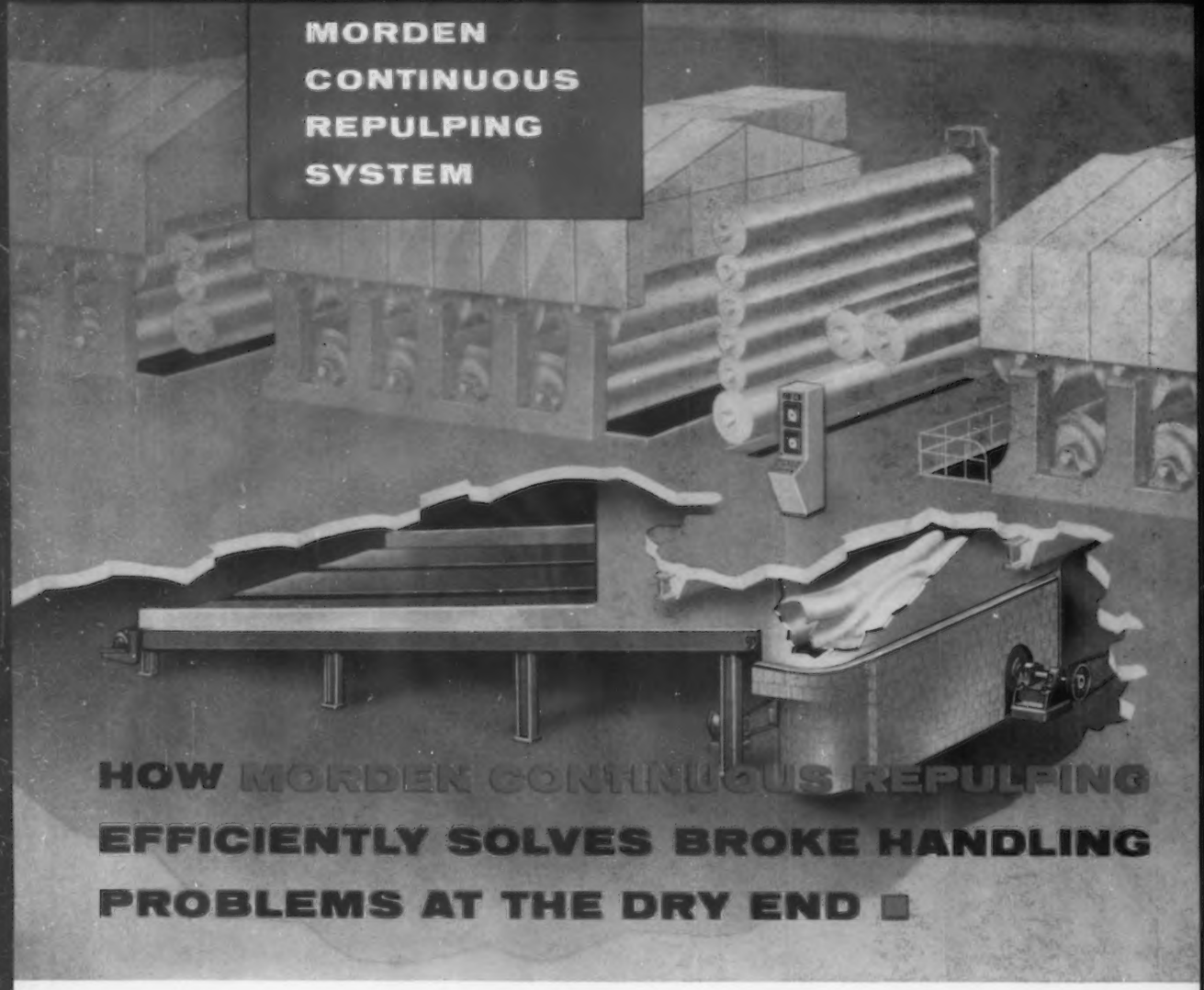


HOW MORDEN CONTINUOUS REPULPING EFFICIENTLY SOLVES BROKE HANDLING PROBLEMS AT THE DRY END ■

THE PROBLEM of haying out at the dry end can now be handled with ease and efficiency with a complete Morden continuous repulping system . . . an ultra modern system that handles a machine break of unlimited duration. At the heart of the system is the time-proven Slush-Maker pulper combined with complete instrumentation.

The illustration shows how a Morden continuous repulping system is designed to handle the accumulation of broke from the breaker stack to the calender and reel area.

A Morden system is designed either with multiple repulpers under the critical areas of the machine or with charging conveyors as illustrated. Continuous systems can also be designed to repulp miscellaneous off-the-machine and finishing room broke.

A Morden repulping system can be tailored to solve your broke handling problem efficiently and completely. The system can be operated continuously or manually. Also, it can be instrumented to operate intermittently with electronic controls to trigger it into immediate action the second the machine hays out.

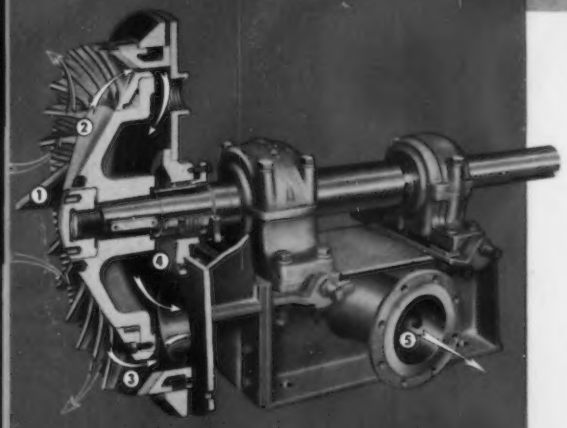
Morden engineers, in cooperation with mill management, engineering and production staff, design the complete process flow of the broke system to circumvent operational problems. Only a Morden system is designed to handle a machine break of unlimited duration.

The versatile continuous Morden Slush-Maker repulping system has proved itself in over fifty installations in leading United States mills. Morden engineers, in cooperation with your engineers, can place at your service the most comprehensive, efficient dry-end broke handling system in the industry.

The superior defibering efficiency of the Slush-Maker eliminates the need for broke refining in most installations. Slush-Makers are now in service on most grades of paper and board.

For appraisal of your broke problems, without obligation, write, wire or phone Morden Machines Co., 3420 S.W. Macadam Avenue, Portland 1, Oregon, CApitol 2-9355, cable "MORDEN."

ADVANTAGES OF THE MORDEN SLUSH-MAKER REPULPER



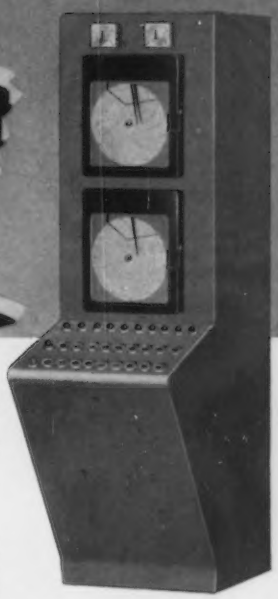
The cut-away view shows the Model C Slush-Maker used for continuous pulping.

Circulation of the stock in the Slush-Maker tank (indicated by the red arrows) is caused by the Slush-Maker rotor blades (1). This circulation maintains a constant flow of stock across the rotor face (2) and past the narrow clearance gap between the rotor shoulder and the surrounding defibering ring (3). The rotor blades keep this gap wiped clear.

The narrow clearance gap selectively allows the well-pulped material (the white arrows) to pass into the chamber (4) behind the rotor for extraction through the elbow (5) and retains the large flakes and bundles in the tank for additional pulping.

Side mounting of the Slush-Maker rotors offers four distinct advantages:

1. Only a tank of minimum cubic capacity is required, thereby reducing the need for costly excavation in the under-the-machine area.
2. Minimum tank size, combined with uniform consistency and controlled stock level through complete pre-engineered instrumentation, assures rapid defibering, excellent submergence.
3. Controlled repulping consistency at 3 to 4% requires no thickening after repulping.
4. Self-screening, non-clogging, positive extraction gives better defibering — usually requiring no separate refining after pulping.

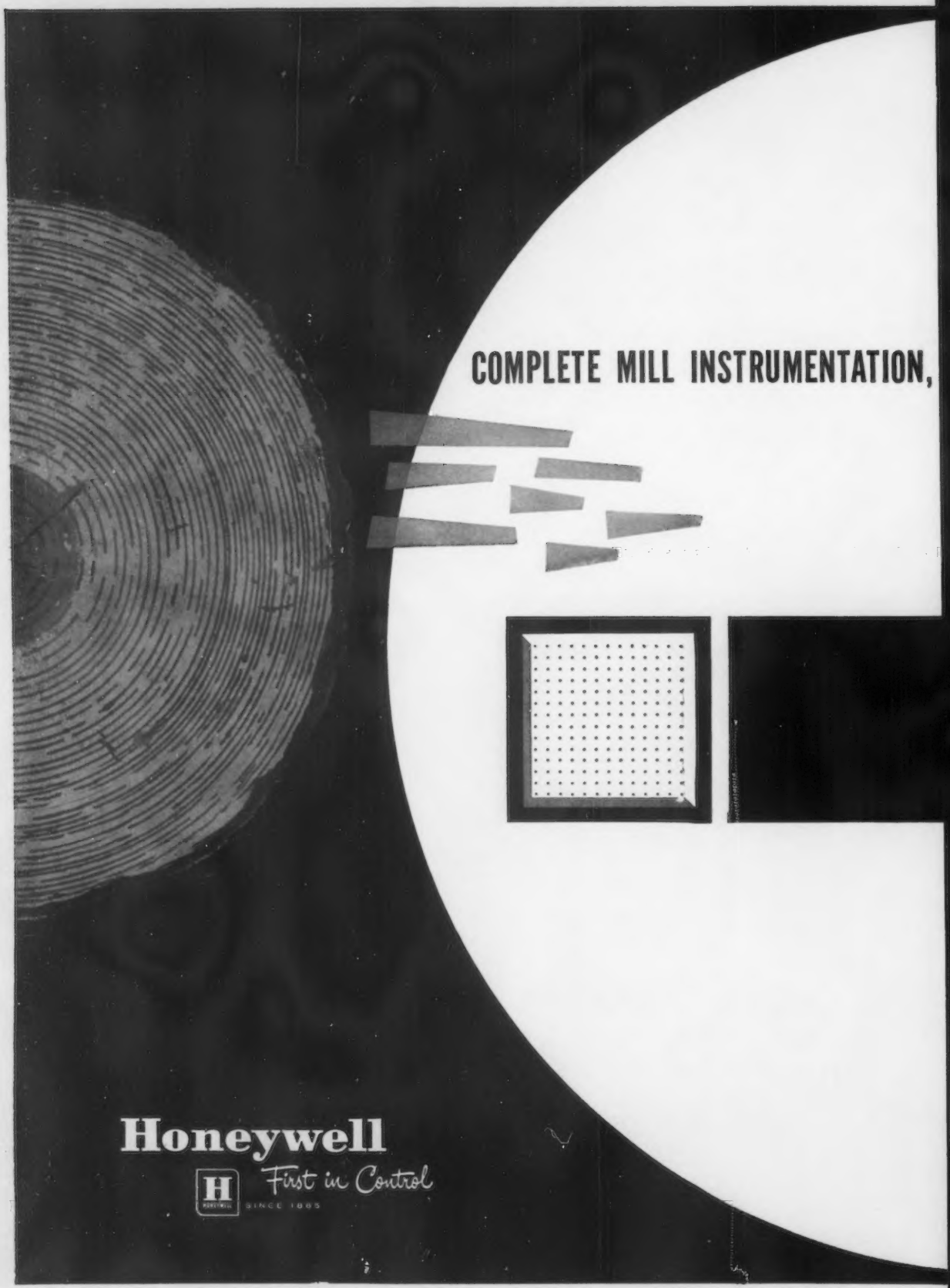


CONTROLS TO SUIT YOUR REQUIREMENTS

Pictured here is a completely prewired and prepiped console provided to house continuous Slush-Maker controls, recorders, indicators and pushbutton stations for the motors, pumps and valves. Details of these units depend upon mill requirements.

MORDEN MACHINES COMPANY

3420 S.W. MACADAM AVE.
PORTLAND 1, OREGON
Phone: CApitol 2-9355 • Cable "MORDEN"


COMPLETE MILL INSTRUMENTATION,
Honeywell
First in Control
SINCE 1885

HONEYWELL STYLE

For the world's most automated fiberboard mill, CELOTEX specified complete mill instrumentation, Honeywell style—*pre-piped, prewired, installed, and serviced.*

CELOTEX solved *with one Honeywell contract* the 1001 special instrumentation problems involved in getting the company's new L'Anse plant into production: instrumentation analysis of the fiberboard manufacturing process; supplying the complete control system; installing the control instrumentation with complete pneumatic piping and wiring; testing and calibrating the system; training CELOTEX personnel to operate and service the system; and providing complete guaranteed servicing for one year after completion of installation. *All in one complete package!*

Honeywell's *Pneumatic and ElectriK Tel-O-Set* recorders, transmitters, controllers, and other miniature instruments bring significant savings to this application. They not only save money and panel space but also permit consolidation of instruments into a more compact, easier-to-read graphic panel. All the instruments used in the pulping operation, for example, are grouped on a single panel rather than two or three which would be required if full size instruments were installed. By using both pneumatic and electric instruments in the control system, CELOTEX is able to utilize the inherent advantages of both types.

Find out more about *Complete Mill Instrumentation, Honeywell Style!* Get in touch with your local Honeywell field engineer. Be sure to ask him about the cost- and space-saving advantages of *Pneumatic and ElectriK Tel-O-Set* instruments. MINNEAPOLIS-HONEYWELL, Wayne and Windrim Avenues, Philadelphia 44, Pa. — In Canada, Honeywell Controls, Ltd., Toronto 17, Ontario.

■ At the new L'Anse plant in Upper Michigan, The CELOTEX Corporation produces a variety of acoustical and decorative fiberboard ceiling tile, insulating sheathing, insulating roof deck, and roof insulation. The plant is designed to turn out more than a half-million square feet of half-inch fiberboard daily.

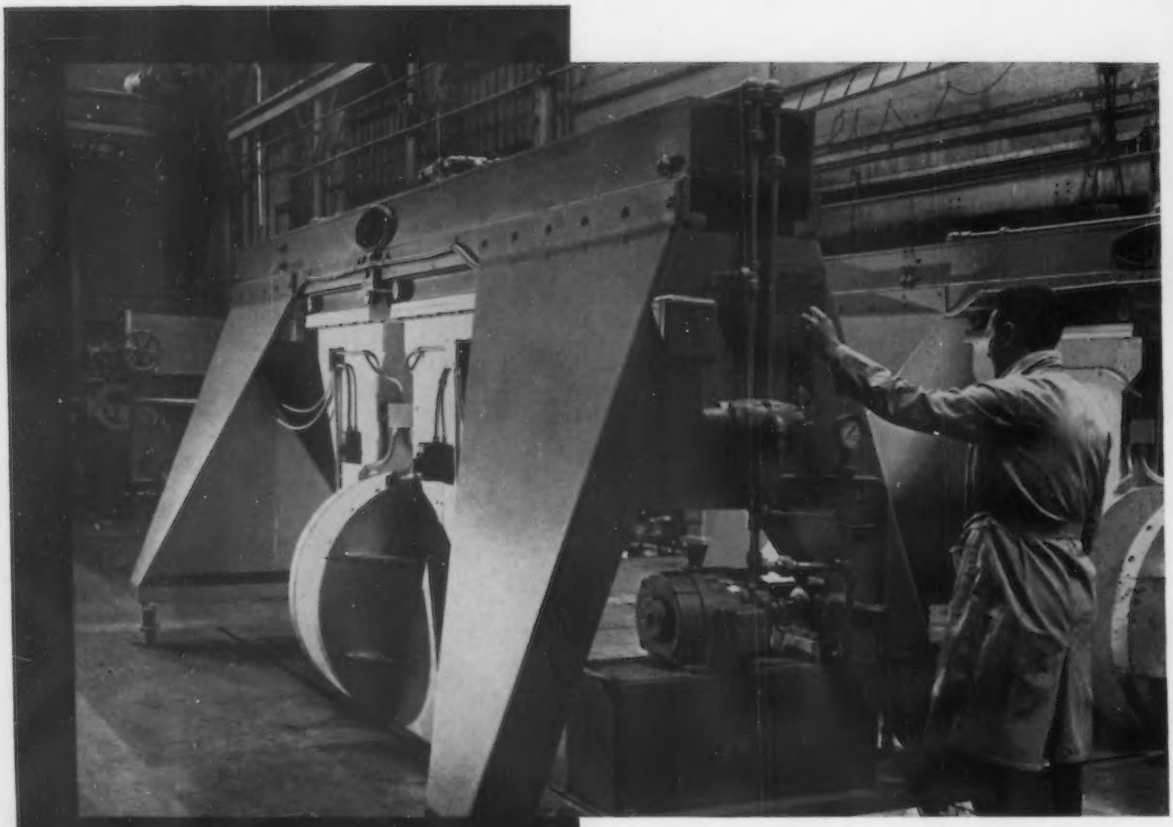
■ The L'Anse fourdrinier machine shown here is the widest wet-process structural board forming machine in the world. The graphic panel in the background controls the entire board machine operation.

■ This graphic panel and other instrumentation, made, installed, and serviced by Honeywell for the L'Anse plant, help make this operation "the only one of its kind in which a fiberboard product travels all the way from manufacturing and fabrication . . . to inspection and packaging on a continuous production line."

SYSTEM DESIGN: Giffels & Rossetti, Inc. Engineers • Architects, Detroit, Mich.

HONEYWELL INTERNATIONAL Sales and Service offices in principal cities of the world. Manufacturing in United States, United Kingdom, Canada, Netherlands, Germany, France, Japan.

at Valley we make it
our business to develop equipment
to help you **REDUCE YOUR COSTS**



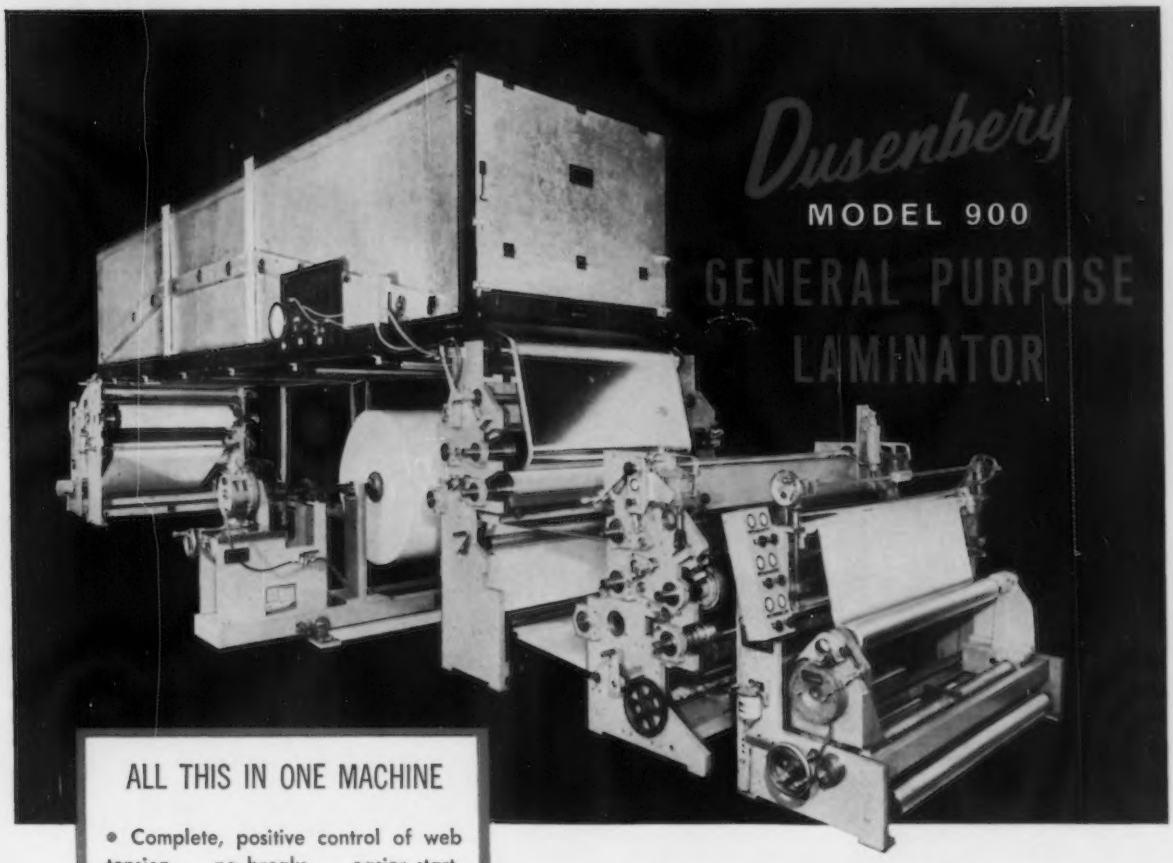
Newly designed Valley Portable Roll Header with electrically heated heads. This mobile unit can "head" rolls at any number of locations, thus saving costly roll handling and moving operations. This is another example of a specially designed and engineered piece of equipment to meet the requirements of a customer and to aid in reducing costs.

in more and more
finishing departments,
as throughout the paper mill,
it's equipment by . . . .

VALLEY

IRON WORKS CORPORATION
Subsidiary of Allis-Chalmers Manufacturing Co.
Appleton, Wisconsin

West Coast Representative: E. A. Berry, P.O. Box 958, Longview, Washington
Canadian Representatives: Pulp and Paper Mill Accessories Ltd. P.O. Box 850; Saint Laurent, Montreal 9, P.Q. Canada



ALL THIS IN ONE MACHINE

- Complete, positive control of web tension . . . no breaks . . . easier starting and stopping.
- Metal foils, plastic films, paperboard, light to heavy paper . . . laminated and coated in every desired combination.
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- Roll interchangeability adds to versatility, reduces your roll inventory.
- New Dusenbery unwind stand helps to provide for bright, wrinkle-free lamination . . . even from inferior, stick-prone foil rolls.
- Designed for simplicity in operation, easy maintenance.

Capacities: Foil Unwind: roll 20" diameter x 65½" wide—Rewind unit: roll 60" diameter x 65½" wide—Speeds: up to 600 FPM for general converting; up to 1000 FPM for special applications. Oven: to suit.

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Top Quality With Lower Costs—You'll be dazzled by the performance of the Dusenbery Model 900 Laminator . . . at the volume of fine work it produces . . . its precision controls that assure top quality at low costs . . . the way it incorporates new concepts of interchangeability for the tailor-made laminating and coating of foil, film, paperboard, paper.

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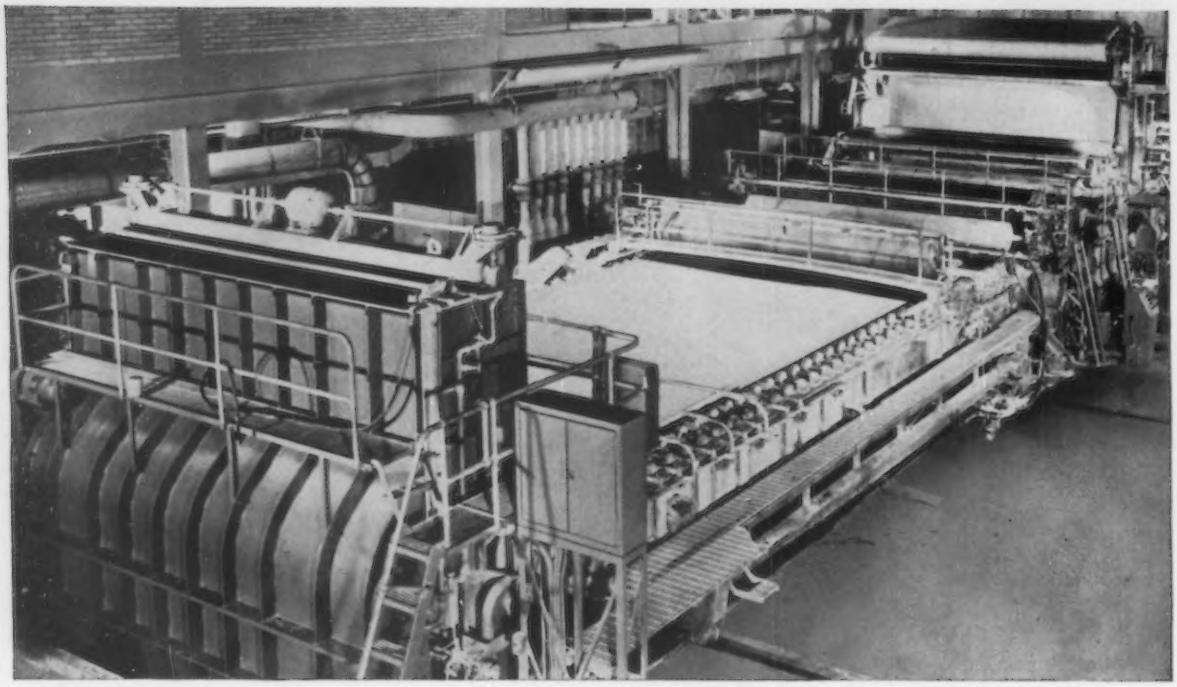


Talk About Rugged Individualism!

Any Fourdrinier machine is an individualist. To begin with, it's not something you buy off a shelf. Custom-made, each one's operating characteristics are all its own and like no other.

It is this very individuality . . . and the resulting potential it offers . . . that has inspired the constant research and development of *WISCONSIN* Fourdrinier Wires, which are as notably different from other wires as each machine is from other machines.

WISCONSIN Wires are custom-matched to the unique characteristics of your specific paper making machine. When the necessary characteristics of this "marriage" are satisfied, then, your machine will develop its full, built-in potential for the highest quality production at the lowest possible operating costs.

The addition of the new LEV-L-WEVE* to *WISCONSIN'S* full line of Fourdrinier Wires represents an important break-away from traditional Fourdrinier Wire application. LEV-L-WEVE offers many added advantages in wire life, production quality and lower operating costs. *WISCONSIN'S* specialized methods and machines have been developed in over 60 years of practical experience and continued research to supply the best in Fourdrinier Wires. Call or write, today, and a *WWW* representative will stop and tell you how *WISCONSIN* Fourdrinier Wires can help to produce dollar savings for your mill. Of course, there is no obligation to you.

*Patent Applied For.

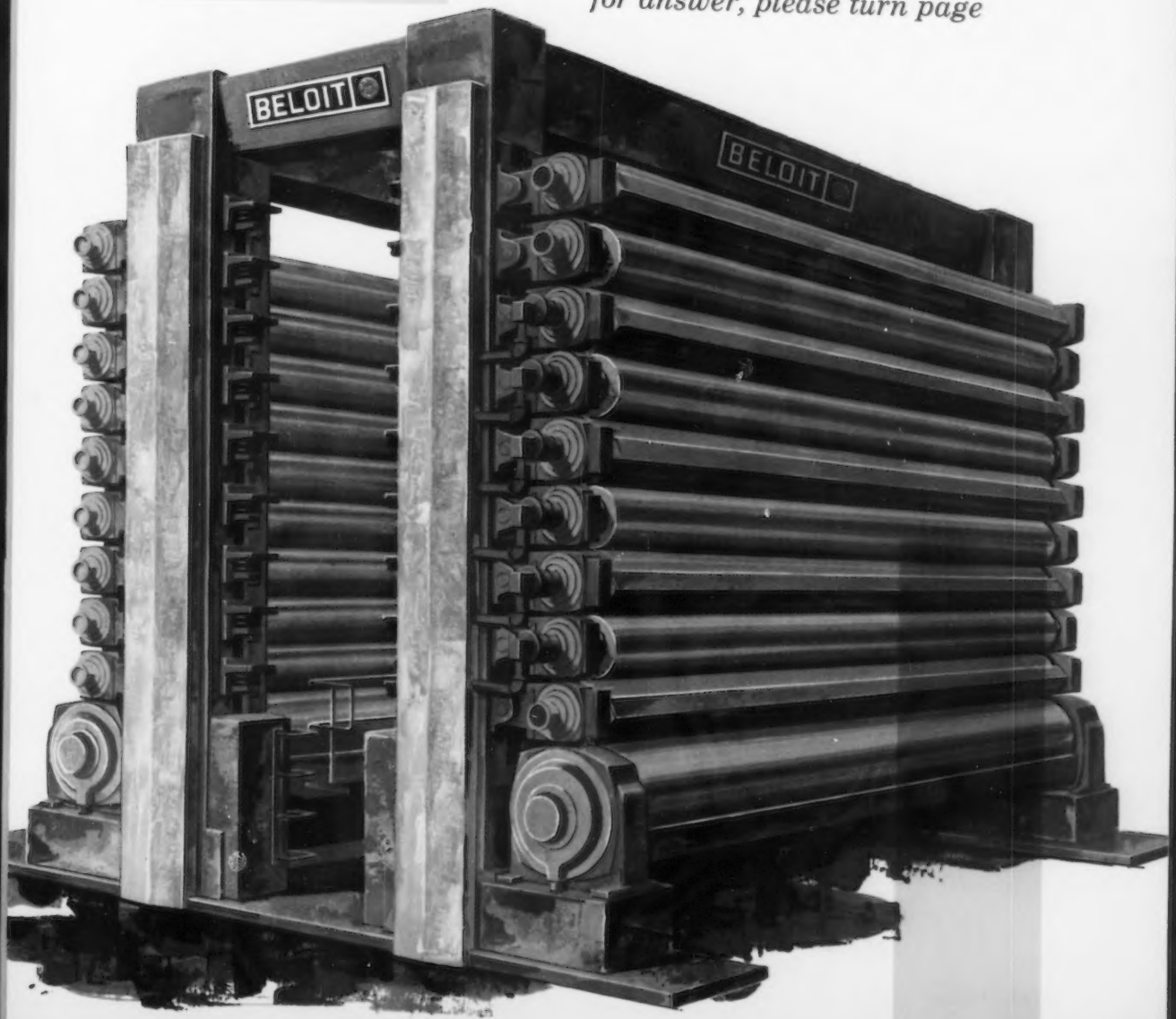
WISCONSIN WIRE WORKS
Box 767 • Dept. J-81
Appleton, Wisconsin

what features
and advantages
does the new

BELOIT CALENDER

design bring
to papermaking?

for answer, please turn page



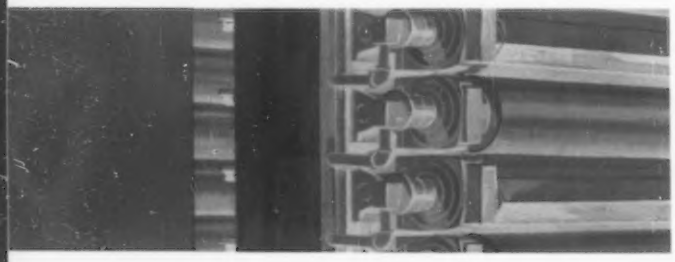
BELOIT CALENDERS

...new concept provides more efficient and economical operation

The new Beloit Calender shown here represents a major breakthrough in calender design and gives promise of greatly increased operating efficiency. Every feature of this new-type machine calender reflects rugged dependability, operator convenience, and ease of operation. Location of roll-lift mechanism in the base eliminates the necessity for service ladders and footwalks, and substantially lowers the over-all calender height. Other important features:

- rapid, positive roll removal
- direct air-cushioned loading and nip relieving
- rolls individually supported in raised position
- operating ease and accessibility.

Descriptive literature upon request.



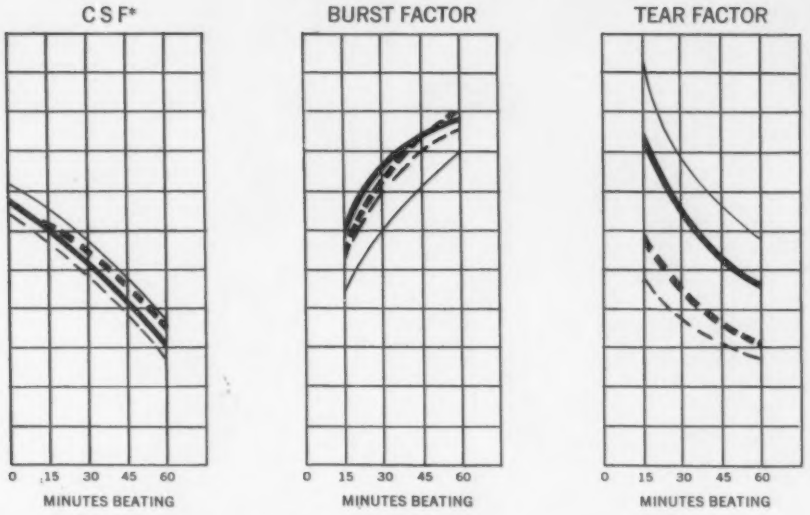
BELOIT

PAPER MACHINERY

your partner in papermaking

CELGAR KRAFT HAS BALANCED PROPERTIES

STRENGTH VALUES



TYPICAL PRIME CELGAR BLEACHED KRAFT
TYPICAL PRIME NORTHERN CANADIAN BLEACHED KRAFT
TYPICAL PRIME WEST COAST BLEACHED KRAFT
TYPICAL PRIME SCANDINAVIAN BLEACHED KRAFT

*Canadian Standard Freeness

As shown by the above graphs, Celgar Kraft compares favourably with the world's best prime bleached kraft pulps in standard pulp tests.

In the all-important beating time to required papermaking freeness, it develops faster than other typical Canadian bleached kraft pulps, comparing favourably with the fast-beating Scandinavian furnish. This feature means high-volume output from repulping equipment at reduced power cost.

The bursting resistance of prime bleached Celgar Kraft exceeds or compares favourably with the best of its competitors while it is excelled only by West Coast bleached krafts in tearing resistance.

This unique and outstanding balance of properties at a high level can be achieved because of the Interior grown tree species used, the climatic conditions under which they grow and the modern process equipment installed in the new Celgar mill. These pulping characteristics, coupled with low beating time and good printability, place Celgar Kraft among the best bleached kraft pulps available in the world.

Distributors and agents for:

Celgar Kraft Pulps and Columbia Cellulose Viscose, Acetate and hardwood and softwood specialty sulphite paper pulps.

Canada and United States
(*kraft and sulphite pulps*)
Columbia Pulp Sales Limited,
1600 Dorchester Street West,
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Ekman & Cie,
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Paris 9, France.

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(*kraft and sulphite pulps*)
Columbia Pulp Sales Limited,
49 Old Bond Street,
London, S.W. 1.

Italy
(*kraft pulps*)
Rappresentanza Ekman,
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Milan, Italy.

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(*kraft and sulphite pulps*)
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GMBH,
Königstrasse 10B,
Stuttgart N, Germany.

Italy
(*sulphite pulps*)
W. Pauly & Co.,
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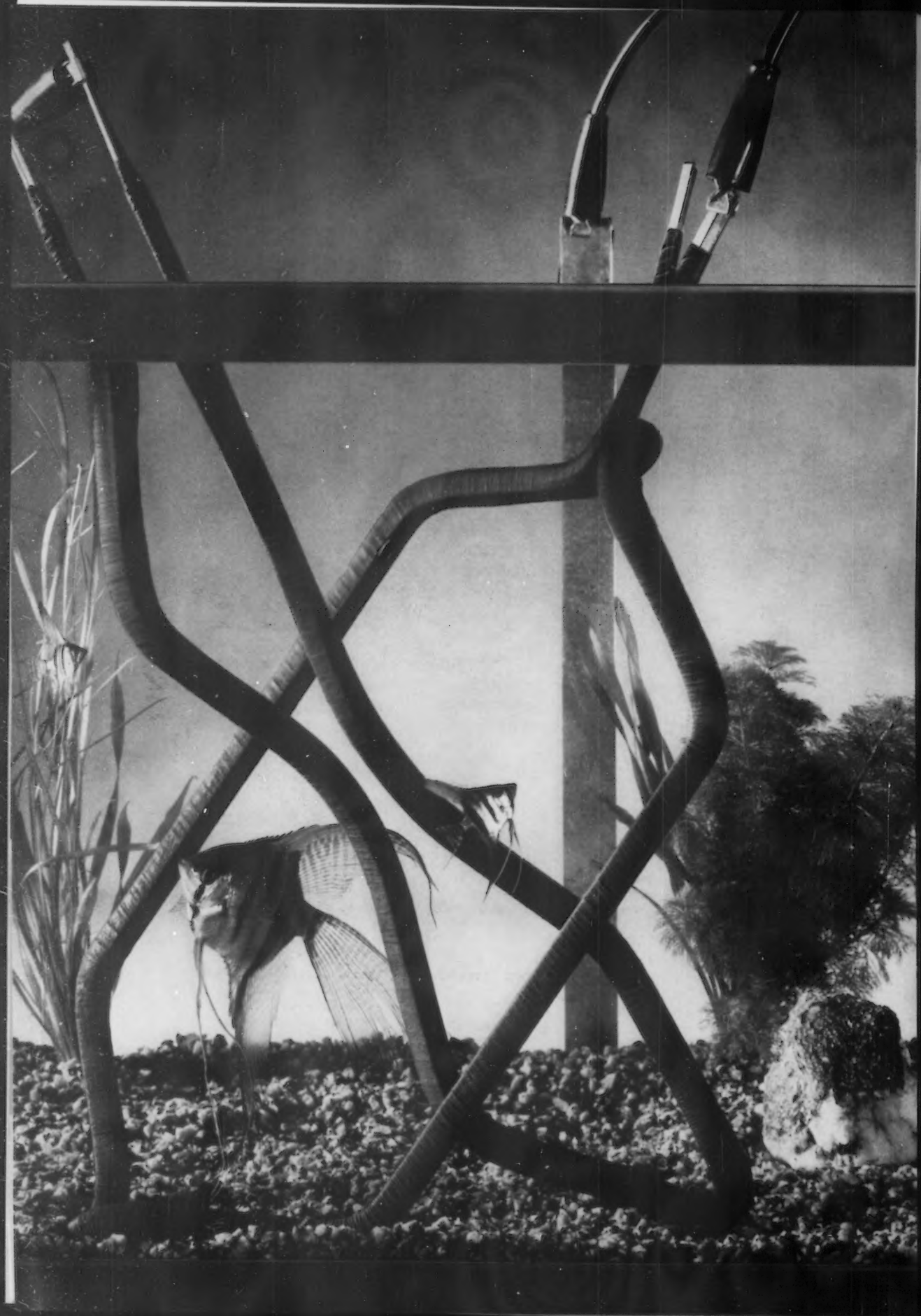
For information regarding other overseas agents please direct request to:
1600 Dorchester Street West, Montreal 25, P.Q.

V6834-1

COLUMBIA PULP SALES LIMITED



Can Your Motor Coils Pass This Test?

E-M Sealflex...

the exciting new flexible epoxy insulation system does!

Sealflex is fully sealed and flexible to provide you with a worry-free coil insulation that protects against water, salt air, dirt, oil, chemicals, solvents and carbon black.

The motor coils on the opposite page are wound with Sealflex. One coil is an undistorted, normally formed coil. The other is bent into a figure 8 to demonstrate the extreme flexibility of the insulation. These 2300-volt coils successfully underwent a water immersion test at more than three times rated voltage! We know you won't be operating your E-M Motor or Generator in an aquarium, but this test demonstrates how a machine of Sealflex-protected coils can minimize your insulation worries.

This amazing, *flexible epoxy* form wound coil insulation system is the result of an extensive, long time program of sealed insulation research between the Irvington Division of Minnesota Mining & Manufacturing Co. and the Electric Machinery Mfg. Company. Fibremat* brand, a flexible B-Stage epoxy insulation, is a product of the world renowned tape research and fabrication facilities of the Minnesota Mining organization. The Sealflex coil is the product of E-M's team of skilled insulation experts . . . backed by more than 60 years of insulation know-how.

Fully-Sealed Protection

Sealflex is a completely sealed system. Each coil is precision wrapped with the newly developed, self-sealing, flexible B-Stage epoxy "Fibremat" brand tape. Curing at 400 F produces a thick, molded-on, tough sheath of high-dielectric strength insulation.

This full sealing, plus the stable characteristics of the epoxy base, make Sealflex especially resistant to tough ambients such as moisture, salt air, dirt, oil, solvents, chemicals, black liquor and carbon black.

Flexible for Long Coil Life

The resilience and toughness of Sealflex is permanent . . . permits the coils to flex with starting loads and to withstand repeated elongation and contraction due to changes in operating temperature. There is no tendency to brittleness and fracturing previously experienced with ordinary epoxy-base insulations.

The abrasion resistance of this new insulation is superior to conventional Class B materials. And its excellence in high dielectric strength and thermal stability contribute to increased reliability and long coil life.

Minimum Upkeep

Because of the super-sealing and moisture-resistant characteristics of Sealflex, there is no need to dry out the machine before startup after a prolonged shutdown. Maintenance is further reduced by the smooth epoxy hide which resists penetration of dust, dirt, and carbon black particles. It cleans easily with air hose or cloth and solvent.

Another first from E-M . . . Sealflex . . . a complete, integrated system designed to provide you with worry-free machine insulation for 130 C (Class B) service in the 600, 3000, and 5000 volt classes.

Get Your Free Brochure

Find out more about the Sealflex System in a new brochure that tells how modern chemistry and modern insulation research made E-M Sealflex best for *flexible*, fully-sealed coil protection from the especially tough ambients involving water, steam, humidity, salt air, dirt, oil, solvents, chemicals, black liquor and carbon black. Ask your nearest E-M Sales Engineer for your copy, or write directly to Electric Machinery Mfg. Company, Minneapolis 13, Minnesota.

*A registered trademark of the Minnesota Mining & Manufacturing Co., St. Paul 6, Minn.

Specialists in making insulation do exactly what you want it to

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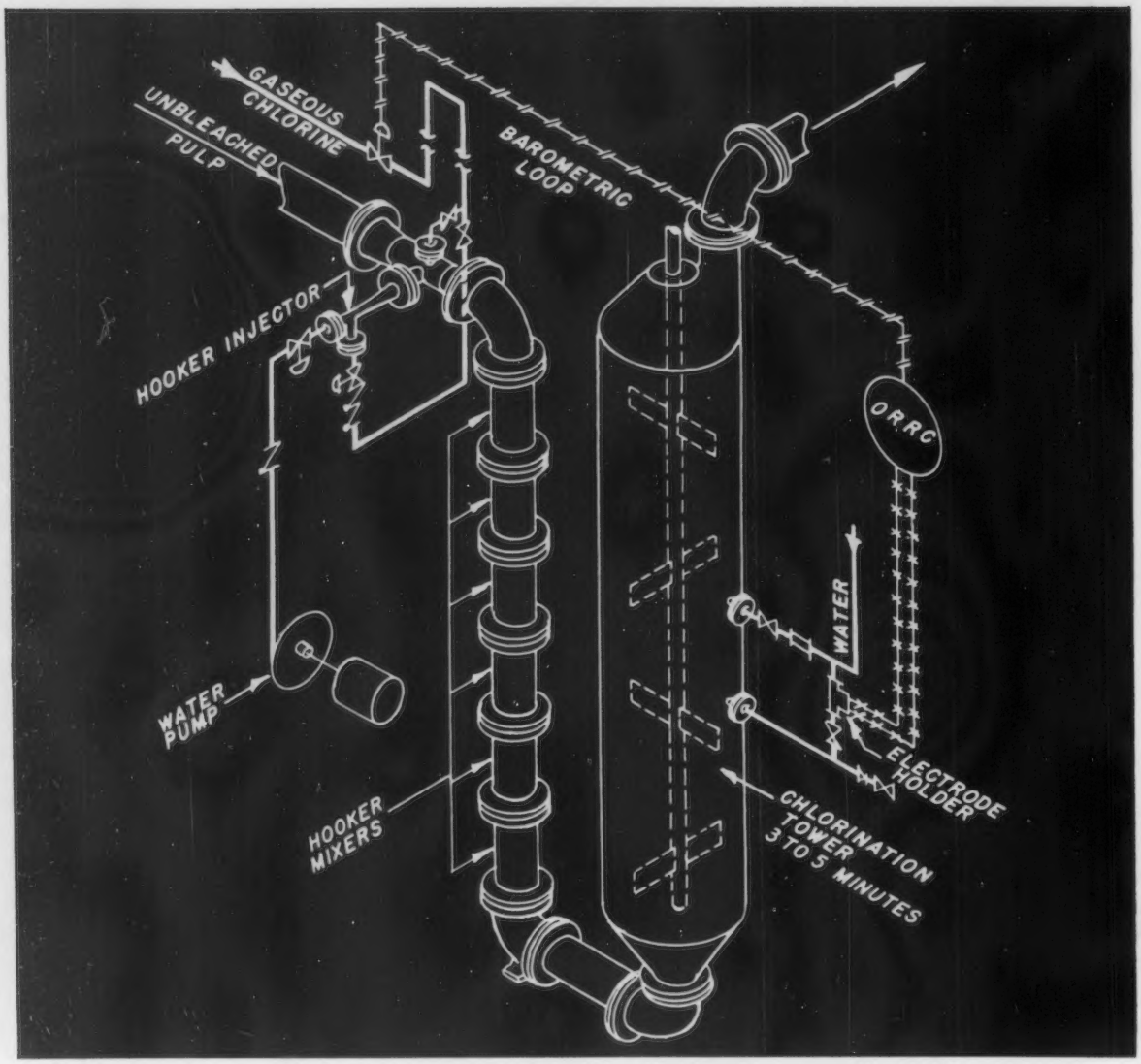
Adjustable-Speed Magnetic Drives • Engine-Driven A-C Generators
Turbine-Driven A-C Generators • Motor Controls • Generator Switchgear



New package whips the variables in pulp chlorination

The first requirement for uniform pulp quality, high pulp strength and high brightness is optimum pulp chlorination—exactly the correct amount of chlorine for each pulp fiber.

Optimum chlorination is accomplished by three steps—each interdependent and equally important:

1. Rapid solution of gaseous chlorine in the pulp slurry—the Hooker chlorine injector is designed specifically for this. Maximum use is made of water energy to atomize the chlorine for rapid, uniform solution in the pulp slurry.

2. Uniform distribution of chlorine solution around each pulp fiber—Hooker stock line chlorine-pulp mixers break up the fiber clumps and distribute the chlorine solution uniformly throughout the pulp slurry. An agitated reactor holding the stock an additional 3 to 5 minutes supplements the stock line mixers. Efficient and continuous mixing is assured throughout the first few critical minutes of the reaction. Each fiber receives the same amount of chlorine.

3. Automatic control of chlorine addition by redox potential—ends the guesswork in chlorine application, reducing chlorine consumption and improving pulp quality. Successful redox control requires efficient chlorine injection and thorough chlorine-pulp mixing.

Hooker technical service engineers will help you design and install the Hooker chlorine injection system, Hooker stock line chlorine-pulp mixers and supplementary reactor, and the redox control system . . . For the full story, write for Bulletin 258: "Improved Pulp Chlorination."

HOOKER CHEMICAL CORPORATION

HOOKER CHEMICALS PLASTICS

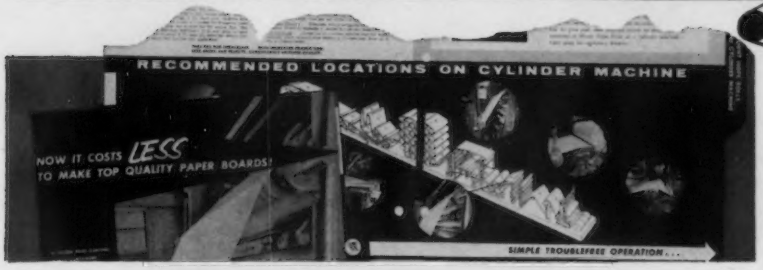
1811 FORTY-SEVENTH ST., NIAGARA FALLS, N. Y. • 605 ALEXANDER AVE., TACOMA, WASH.

Sales offices: Buffalo, Chicago, Detroit, Los Angeles, New York, Niagara Falls, Philadelphia, Tacoma, Worcester, Mass. *In Canada:* Hooker Chemicals Limited, North Vancouver, B. C.

FACTS, FIGURES AND IDEAS DESIGNED TO Mount Hope SAVE YOU TIME AND MONEY

web control NEWS

Volume 1, Number 4


RECOMMENDED LOCATIONS ON CYLINDER MACHINE
NOW IT COSTS LESS TO MAKE TOP QUALITY PAPER BOARDS!
SIMPLE TROUBLEFREE OPERATION...

6 WAYS TO SAVE MONEY IN 12 LOCATIONS ON A CYLINDER MACHINE

Judging from increasing installations of Mount Hope Rolls, these versatile rolls are proving a boon to manufacturers of paper boards. Users report substantial dollar savings in these six areas:

1. *Lower Steam Consumption*—Bottom wet felts and Press felts that are clean and open take out more water, thus taking a load off the dryers.

2. *Increased Production*—With felts cleaner and easier to dry, machines can be speeded up. Keeping boards wrinkle-free cuts down waste, produces more usable product per hour.

3. *Improved Finish*—Mount Hope Rolls assure smoother felts with minimum weave impression that yield smoother backs and liners, better printing.

4. *Protected Printing Values*—Keep top felts clean and preserve the nap. Provide a firmer printing surface that minimizes picking and checking. Keeps fiber lint out of the ink fountain.

5. *Lengthened Felt Life*—Eliminate or reduce use of whipper on wet felts. Preserve elasticity of weave threads and keep nap soft.

6 *Reduced Felt Costs*—Prevent shrinkage of felt and guarantee longer felt life.

12 Recommended Locations for the Mount Hope Roll

1. **Top Finishing Felt**—Preserves felt elasticity and nap. Keeps water drainage even. Provides a better printing surface that minimizes "checking," "picking," and "flowering."

2. **Bottom Wet Felt**—Keeps weave open, seam straight. Provides even water drainage across felt width—eliminates wet streaks. Restores felt to desired operating width each revolution.

3. **Press Felts**—Keeps felt open and seam straight entering nip. Provides better finish with less felt impression; more uniform drying with less curl.

4. **1st Dryer Section (Stretching the Sheet)**—Increases trim. Trim a greater variety of widths or hold width with less expensive furnish.

5. **Breaker Stack**—Prevents wrinkles and cuts.

6. **Size Press**—Eliminates wrinkles after size press and prevents wrinkles due to uneven drying.

7. **1st Calender Stack**—Keeps sheet taut and even; free from slack spots—whether it goes over the top roll or in the nip. Prevents calender cuts.

8. **Between Calender Stacks**—Eliminates water-box wrinkles. Reduces tension between stacks. Gives more uniform finish on second stack—less broke.

9. **Machine Reel**—Smooths out thin soft spots caused by calender stack heat. Spreads the slack outwards and tightens up the edges. Builds a good, hard Roll.

10. **Winder**—Feeds an evenly tight sheet. Assures open slitter cuts. Prevents interleaving.

11. **Cutter**—Feeds smooth, wrinkle-free sheets. Maintains square cut sheets.

12 **Coaters**—Prevents wrinkles, assures even coating and drying.

Increase Felt Life

DECREASE FELT COST PER TON

REDUCE DOWNTIME

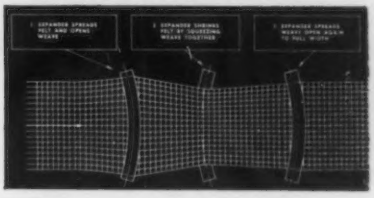
Results from Hundreds of Mills Can You Do As Well?

The results above have been achieved with the combination of Mount Hope Rolls shown below.

There are many ways that single or multiple Mount Hope Rolls can be installed on your Fourdrinier or Cylinder machine to improve your felt conditioning.

One certain fact: If you are not now using Mount Hope Rolls on your felts their installation will most certainly improve your product and cut your manufacturing costs.

Felt Cleaning on Pick up Felt. A Mount Hope Roll can be mounted directly ahead of shoe or suction box to open felt up for better suction and cleaning. This is the more popular type of felt-cleaning installation.



Felt Cleaning on Cylinder and Wet Machines. As shown in the diagram, the combination of three Mount Hope Rolls gently opens and closes the pores of the felt to dislodge embedded stock or pulp while at the same time keeping the face straight and square, soft and "live."

MOUNT HOPE MACHINERY COMPANY
74 FIFTH STREET, TAUNTON, MASS.
Plants: Taunton, Charlotte and in England.
Sales Engineers in Principal Cities.
World Wide Distributors: Mount Hope Machinery S.A., Lausanne, Switzerland.

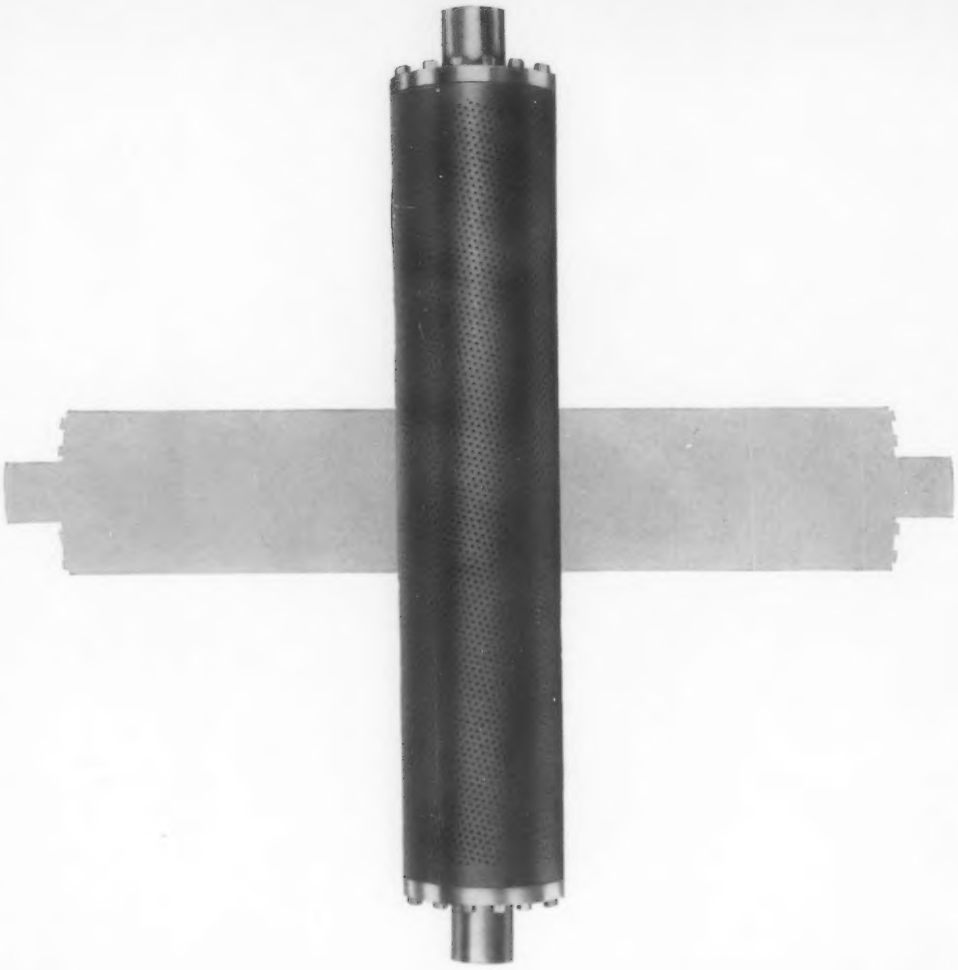
Mount Hope Makes the Following Web Control Equipment for Papermakers and Converters:

- Mount Hope Rolls
- Vari-Bow Rolls
- Felt Preservers
- Tension Controls
- Floating Roll Guides
- Swinging Roll Guides
- Floating Carriage Guides
- Web Viewer
- Precision Guiders
- Light Duty Wind & Unwind Stands

The following are Registered Trade Marks: Mount Hope; Vari-Bow.

© 1961 Mount Hope Machinery Company

For more information on the products mentioned above or on any felt or paper handling problem, contact Mount Hope or check the Reader Service Card. Please write in on the card the product(s) you are interested in.



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by S-W and its licensees are in service throughout the free world. Ask your S-W Sales Engineer about the facilities and abilities of the people who cover more suction rolls than anybody.

75th YEAR S-W INC.

more tons from every cover because of technical leadership

STOWE-WOODWARD, INC.

Newton Upper Falls, Mass. *Neenah, Wisconsin* *Griffin, Georgia*

on the West Coast • HUNTINGTON RUBBER MILLS INC. • Seattle, Washington • Portland, Oregon • Port Coquitlam, British Columbia, Canada

Trends

Outlook Improving for Industry Earnings

"The prospect of record economic activity in each successive quarter of 1962 suggests a steady rise in paper and paperboard consumption. With capacity expanding at a considerably slower rate than that experienced in recent years, the improving supply-demand relationship and firming price structure (with selective price increases likely in the spring of 1962) should allow progressive recovery in earnings over coming months." predicts Standard & Poor's in its latest paper industry survey.

Industrial Paper Sales Continue Records

Sales activity for the nation's industrial paper merchants in September reached record heights for the second consecutive month. A decrease of three working days from August, however, lowered the index by 12.6%. Activity advanced by 0.5% over August levels, comparable to the normal 2% increase from August to September and marking the eighth consecutive monthly gain. The level of activity now stands 25% ahead of January. Cumulative totals for the first nine months of 1961 moved to within 0.3% of corresponding 1960 totals, while activity for this period showed a slight increase of 0.2% for the first time this year.

Canadian Board and Wrapping Ahead

Production of paperboard in Canada was 2% ahead for September and 0.5% for the nine month period. Canadian wrapping paper output in September was 8% above the same month in 1960 and 6% ahead for the nine month period.

Merchants Printing Paper Sales Advance in September

Printing paper merchant sales activity in September advanced 5.6% over August levels to the second highest point in history. The advance was comparable to the normal increase from August to September of 6%. Due to a decline in working days by three, the index of total sales fell 8%. Compared to September 1960 total printing paper sales were off by 1%. Consideration of the effect of one less working day, however, shows an increase in activity of nearly 4% over the previous year. Cumulative totals for the first nine months of 1961 measure 0.54% ahead of the corresponding period in 1960, while activity has advanced by nearly 1%.

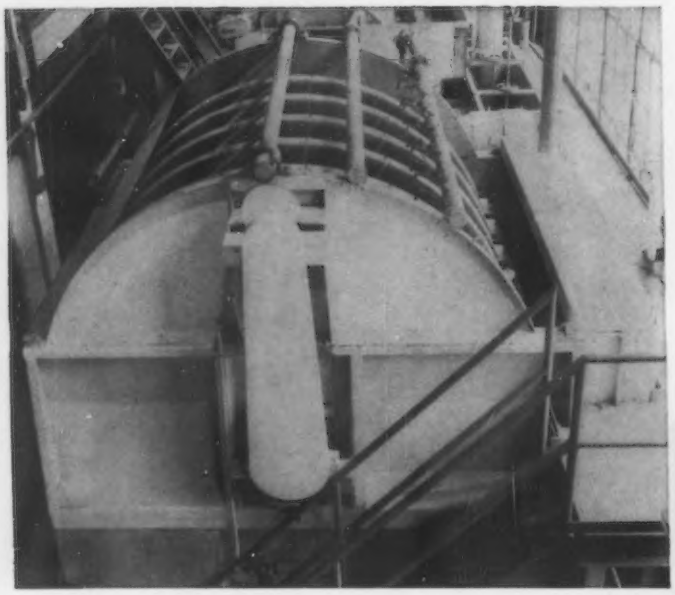
First Step to Paper Machine Automation

The first real step towards automation of the paper machine is revealed in the account in this issue of the I. B. M. computer installation at Potlatch (See page 35). However, it is only the first step with a long, long way to go yet.

NEW IMPCO

Disc Type Filter Design

At Scott Paper Company, Mobile, Alabama



Molded Discs and One-piece Stainless Core Raise Capacity and Clarity Standards — Due to New Hydrodynamic Design Concept.

Close up your white water system with the new Impco Disc Filter! This saveall concept, with its molded sectors and one-piece stainless core, is a fresh approach to disc type filtering. Hydrodynamic design and latest materials now give you a truly ultramodern filter.

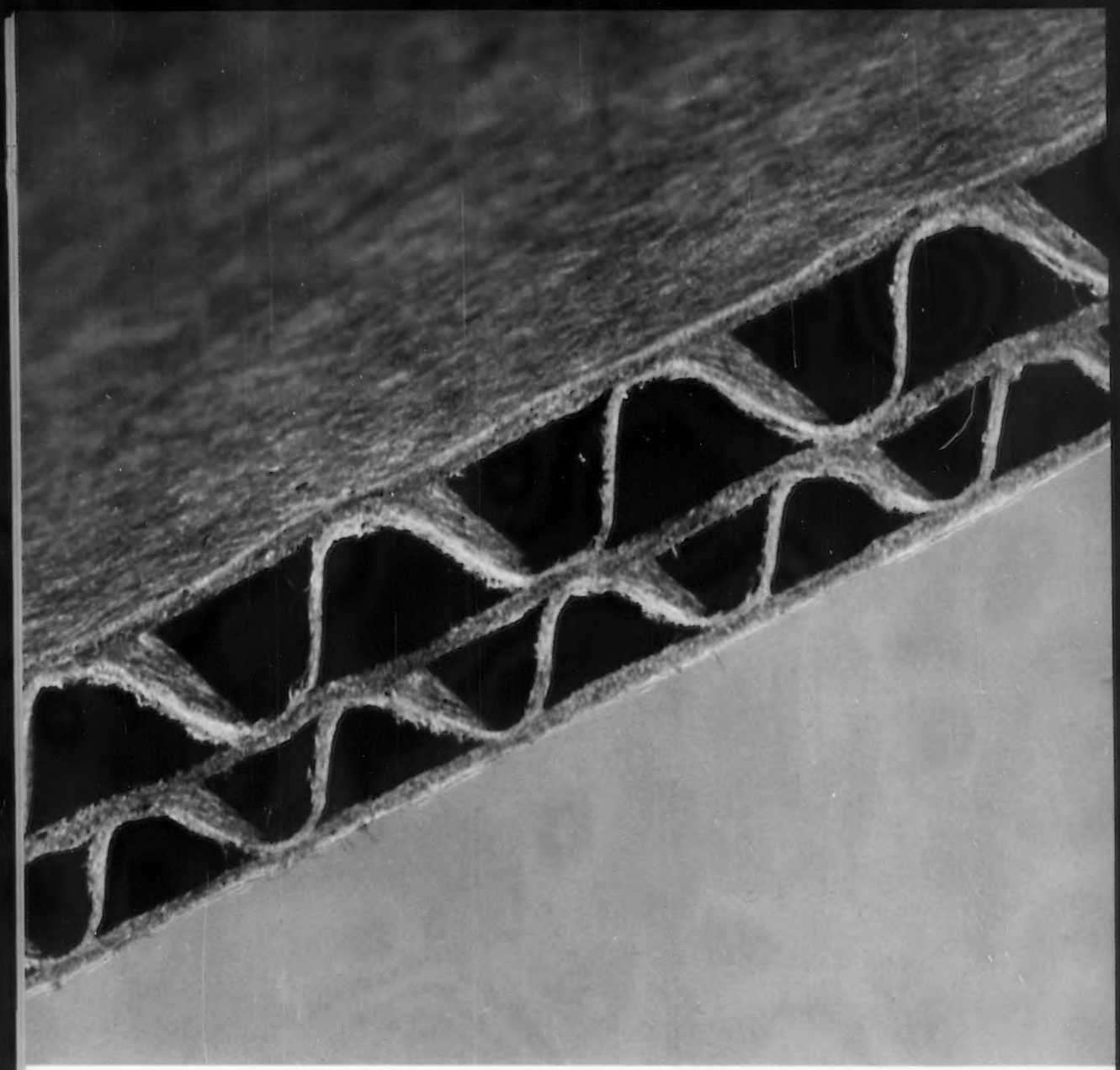
Swept back, molded, lightweight, bonded-face sectors increase capacity and wire life. Contra-flow inlet eliminates pulp thickening in vat. Eighteen ported trunnion and full 180° valve opening produce sharpest filtrate separations. Speeds from ¾ to 4.5 R.P.M. Ask your Impco Sales Engineer for full information and write for Bulletin A5-1.

Above: Six-disc unit minus vat, showing valve and dual filtrate discharge. Filters available in sizes up to sixteen discs. Keyed aligning and attaching device makes assembly of a complete disc the simplest yet. A complete disc consisting of eighteen 22 pound sectors is assembled in one hour.

IMPROVED MACHINERY INC. NASHUA, NEW HAMPSHIRE

IMPCO®

IN CANADA: Sherbrooke Machineries Limited, Sherbrooke, Quebec



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to meet any operating conditions, try...

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WRITE OR PHONE *Corn Products for expert technical assistance... helpful data on these fine products for Paperboard Manufacturers:*

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Apply Garlock 5875 Teflon-impregnated LATTICE BRAID Packings** to centrifugal and rotary pump shafts, valve stems and expansion joints, and reciprocating rods, rams, and plungers . . . a premium packing at regular packing prices.

**Patent applied for

ENGINEERED TEFLON* PRODUCTS

Exclusive Garlock manufacturing technique creates unique properties in Teflon-impregnated LATTICE BRAID Packings. The use of pre-sintered Teflon powder gives new, low cost Garlock 5875 LATTICE BRAID† Packing greater stability under temperature changes and outstanding resistance to glazing. The pre-sintered Teflon powder on the white asbestos yarn does not absorb water; hence, there is no "wicking" action, and minimum axial swell. The ground particles of Teflon form millions of bearing points on the packing surface . . . effectively reduce friction and wear . . . once installed, retightening or adjustments are rarely, if ever, necessary. Garlock 5875 LATTICE BRAID Packing contains over 30% Teflon by actual weight—affords excellent resistance to moderately destructive and corrosive acids and caustics from −90°F to +500°F.

Costs no more than regular packing. Garlock 5875 LATTICE BRAID Packing sells for almost 40% less than other Teflon packings in use today. At this price, you can enjoy all the new features of 5875 plus the advantages of LATTICE BRAID construction: completely integrated structure for greater strength, longer life, more flexibility and lower maintenance cost. No single outer braid or cover to wear through. Garlock 5875 LATTICE BRAID holds together without disintegrating, wears far beyond ordinary packings.

Enjoy fast delivery from warehouse stock. Garlock 5875 Packing is immediately available in sizes from ¼" through 1" in either spool or reel form to meet your specific needs. Call your local Garlock representative at the nearest of the 26 Garlock sales offices and warehouses throughout the U. S. and Canada. Or, write for Catalog AD-185, Garlock Inc., Palmyra, New York.

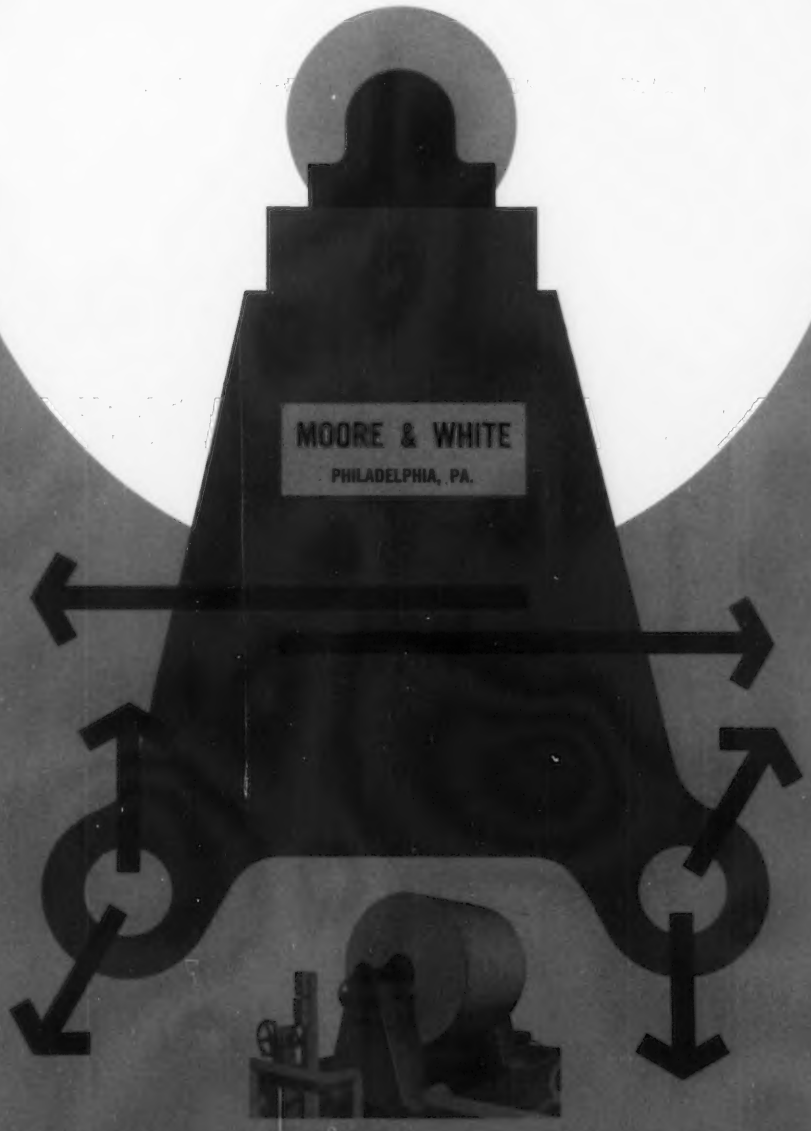
Canadian Div.: Garlock of Canada Ltd. **Plastics Div.:** United States Gasket Company. **Order from the complete line** of quality Garlock products . . . Packings, Gaskets, Seals, Molded and Extruded Rubber, Plastic Stock and Parts.

*DuPont Trademark for TFE Fluorocarbon Resin †Registered Trademark

GARLOCK

THE MOORE & WHITE SHAFTLESS BACKSTAND

increases available working time and provides greater flexibility for a wide variety of web fed equipment such as cutters, rewinders, laminators, etc.

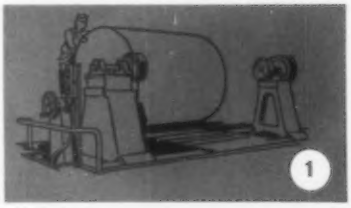


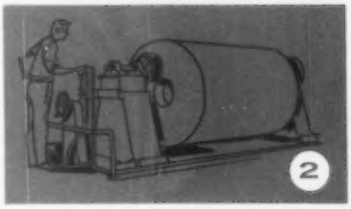
- Easy roll handling, one-man operation without special labor, overhead cranes, lift trucks, etc.
- Handles a variety of roll widths and sizes.
- Complete power adjustment.
- Automatic tension control.
- Effective pneumatic braking.

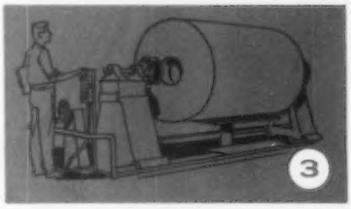
THE MOORE & WHITE COMPANY

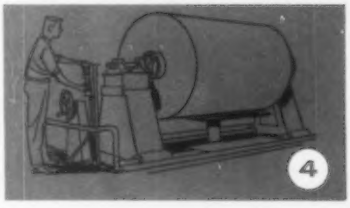
Easy roll handling by one man with

The MOORE & WHITE
SHAFTLESS BACKSTAND









Roll is pushed on floor tracks or rolled (1) between the end stands where a hydraulic lift (2) raises the roll into position (3) The end stands are then run (motor driven) into position until pneumatic chucks engage and lock the roll on the spindles (4) A large size pneumatic brake (5) controls unwind tension and stops the revolving roll automatically and instantly in the event of a paper break. Easy adjustment in all directions (6) assures that any roll will run true. Extra heavy duty construction assures trouble free operation.

A series of Moore & White shaftless backstands provide multiple feed or successive feed for a wide variety of converting equipment. For example, three stands can feed lightweight grades simultaneously. When successive feed is needed, maximum utilization can be obtained by running the back unit first, followed by the second. Then, as the roll nearest the machine is being run, the other two are reloaded. The process is repeated in the same order; while the roll on the middle stand is run the back one is reloaded. Run this way, a three stand arrangement permits a single operator to run 6 rolls without downtime for reloading. Users report working time and flexibility equal to or greater than that realized with shuttle type duplicate backstands.

You can save time and money with the greater machine utilization possible with Moore & White Shaftless Backstands—designed and produced to fit your special needs by

THE MOORE & WHITE COMPANY

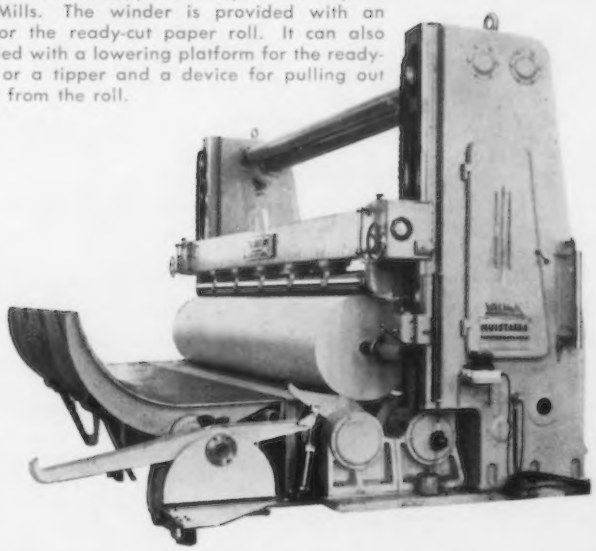
330 EAST HUNTING PARK AVE., PHILADELPHIA 24, PENNSYLVANIA, GArfield 6-9439
WEST COAST: STEPHEN THURLOW COMPANY, 1912 MINOR AVE., SEATTLE, WASHINGTON

76 YEARS

new VALMET designs

for more effective paper production

A winder of new design, with a slitting speed of 2,000 metres/min., supplied to Kymin Osakeyhtiö Voikka Mills. The winder is provided with an ejector for the ready-cut paper roll. It can also be supplied with a lowering platform for the ready-cut rolls or a tipper and a device for pulling out the shaft from the roll.



As the speed of paper machines increases the length of standstill periods affects productivity more and more. Even great speed is of little value if SERVICING, MAINTENANCE and OPERATION take too much production time. Close cooperation with paper producers is apparent in Valmet's designs. By making the wire and felt changing and machine servicing quicker the Valmet designs shorten the standstill periods. New Valmet designs have cut down expense of handling and receiving finished products. Every minute gained for production increases its competition value.

Above:

A paper machine supplied by Valmet to Kymin Osakeyhtiö Voikka Mills. Length 105 metres, designed speed 800 metres/min., trimmed working width 530 cm., annual output 70,000-80,000 tons.

VALMET

VALMET OY, HELSINKI, FINLAND. CABLES: VALMET HELSINKI. TELEX: HELSINKI 12—427

TITANOX*... the first name in paper pigmentation

For all surface applications requiring anatase TiO_2 pigment:

TITANOX-A-CG

(CG = coating grade)

- particularly suited to high solids, high speed coatings applied by the trailing blade coater
- entirely suitable to coatings applied by all other processes, including size press and calender
- characterized by ease of dispersion at high solids, low viscosity and stability of coating suspensions, and minimum abrasion
- outstanding for freedom from agglomerates and for readily producing high gloss and maximum smoothness of fine finishes
- preferred for all types of coated papers, except waxing and similar stocks that may require TITANOX-RA-50

For beater-pigmented papers requiring anatase TiO_2 pigment:

TITANOX-A-WD

(WD = water dispersible)

- particularly adaptable to central slurrying systems because of low water absorption
- provides optimum retention

For waxing and similar stocks, especially in coatings:

TITANOX-RA-50

(rutile titanium dioxide)

- easy dispersion yields smooth suspensions at high solids that are free from coarse agglomerates
- provides highest brightness and opacity obtainable in waxed and similar stocks
- ideal for use in situations where the opacifying power of anatase TiO_2 is insufficient

In addition to the above, we are in a position to offer highly specialized titanium dioxides to solve particular problems, particularly where TiO_2 is the determining factor. For information on the type of TITANOX best suited to your particular requirements, we invite your inquiries. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; offices and warehouses in principal cities. In Canada: Canadian Titanium Pigments, Ltd., Montreal.

6006

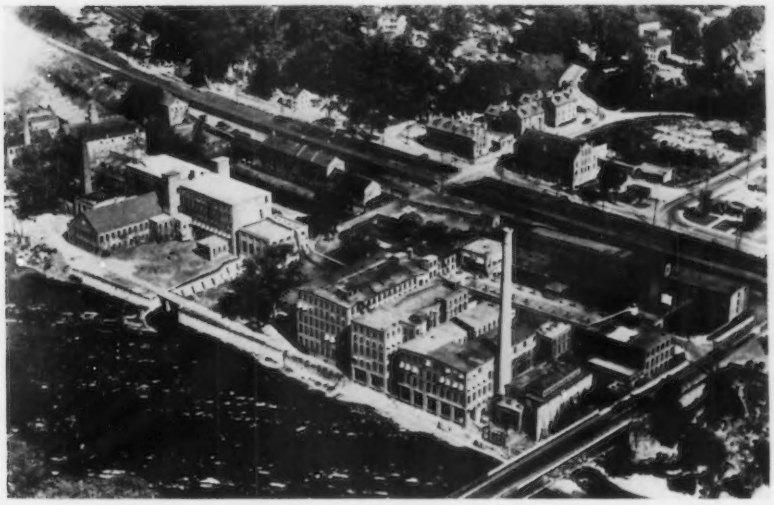
*TITANOX is a registered trade mark of National Lead Company for titanium pigments offered by Titanium Pigment Corporation.

TITANIUM PIGMENT CORPORATION

Subsidiary of NATIONAL LEAD COMPANY

PJT | PAPER TRADE JOURNAL

WEEK OF NOVEMBER 13, 1961



Hammermill Obtains Control of Strathmore

Hammermill Paper Co. of Erie, Pa., has entered into agreement with two major stockholders of Strathmore Paper Co. to acquire a controlling stock interest.

F. Nelson Bridgham, chairman of the board of Strathmore, and Henry D. Johnston, Strathmore president, made the announcement. They said they preferred not to identify the two stockholders.

Hammermill, which lost a proxy fight for control of United States Envelope Co. to West Virginia Pulp & Paper Co. last year, will acquire 42,528 shares of the capital stock of Strathmore in exchange for 63,792 shares of Hammermill common stock.

In June 1960, Hammermill purchased a controlling stock interest in Old Colony Envelope Co. of Westfield from Strathmore with Strathmore continuing to hold "an important minority interest" in Old Colony.

Through the sale, Hammermill acquired an envelope maker, which it was unable to do when it sought to merge with U. S. Envelope.

In their announcement, Messers Bridgham and Johnston said:

"Strathmore will continue to operate under its own name. The management and operating policies of the company will be maintained, and will continue to be administered by the present management under the direction of F. Nelson Bridgham, chairman, and Henry D. Johnston, president. Our products will continue to be distributed under the established sales policies on which our reputation is built."

Strathmore has paper mills at West Springfield, Woronoco and Turners Falls, all in Massachusetts, with three paper machines at each location.

A major share of Strathmore products is distributed nationally through paper merchants. The annual sales of Strathmore are approximately $14,500,000.

C.F.P. to Add Continuous Digestor at Howe Sound

Canadian Forest Products, Ltd.; Vancouver, B. C., has just purchased a combined continuous cooking and diffusion washing system from Kamyr, Inc., for its Howe Sound Pulp Division located at Port Mellon, B. C., Canada.

This unit will be designed for the production of 325 air-dry tons per day of a bleachable grade of kraft pulp and will include a counter-current brown stock washing zone following the time at temperature and before pressure release. This will be the first Kamyr installation of its kind in North America and opens a complete new approach to the concept of pulp mill design and layout.

Sandwell and Co. of Vancouver have been retained as the consulting engineers for the complete project. A new bleaching system will be installed by Sherbrooke Machineries (Impco).

Installation of the new digester is expected to be completed by spring.

Bowater-Scott to Form Danish Affiliate

Scott Paper Co. has announced that its English affiliate, Bowater-Scott Corp., Ltd., has agreed with a Danish company to form a new affiliate in Denmark, called Bowater-Scott Skan, for the manufacture and sale of sanitary paper products.

The new Danish company will be capitalized at $100,000 with Bowater-Scott subscribing to half of the common stock and C. Schous Fabriker A/S, a leading Danish retailing organization, subscribing to the remainder.

Scott thus continues the policy of equally sharing ownership of its foreign affiliates with local interests. The company has affiliates in Australia, Belgium, Canada, Colombia, England, Italy, Japan, Mexico, and the Philippines.

The newly formed Danish corporation will convert finished sanitary paper products from parent rolls shipped from Bowater-Scott in England and, to round out the Scott line, will import finished goods for marketing in Scandinavia. The main plant will be located at Orevad, outside of Copenhagen.

Weyerhaeuser Springfield Mill Gets PNPCA Award

Weyerhaeuser Co.'s kraft pulp mill at Springfield, Ore., recently received the first industrial air and water protection award presented by the Pacific Northwest Pollution Control Assn.

The award was given Weyerhaeuser for its continuing air and water protection accomplishments during the 12 years the Oregon mill has been in operation. It was presented at the conclusion of the association's 28th annual meeting, held in Tacoma, October 25-28. Bethlehem Steel Co. of Seattle received honorable mention in the final judging.

Initiated to provide greater recognition for industrial organizations making significant contributions in the field of air and water protection, the award will be given annually.

U. S. Paper Mill Machinery Exports Jump $3 Million

U. S. exports of paper mill machinery, which were $11.97 million in the first half of 1960, increased to $14.94 million for the comparable period this year, according to U. S. Bureau of the Census figures.

Substantial increases were reported in exports to Venezuela, up from $127,000 to $3.14 million; Sweden up from $368,000 to $2.06 million, and France up from $206,000 to $379,000.

Shipments of paper mill machinery to Japan, Mexico, and West Germany were considerably lower in 1961 than in 1960.

Paper and Paperboard Production

The American Paper and Pulp Association reported the ratio of the United States paper production to mill capacity for the week ending October 28, 1961, at 94.5 per cent, compared with 93.2 per cent, revised, for the preceding week. The ratio was 95.8 per cent for the corresponding week a year ago.

The National Paperboard Association reported the paperboard production ratio for the week ending October 28, 1961, at 99 per cent, compared with 97 per cent for the preceding week and 91 per cent for the corresponding week a year ago.

(Detailed Statistics on page 70)

Exports of other types of pulp and paper machinery remained rather stable. Pulp mill machinery exports declined from $5.8 million to $5.5 million. Paper bag making machinery rose from $626,000 to $706,000, and paper converting machinery increased from $9.6 million to $10.4 million.

Third Mill for Newfoundland Still Possible

Another pulp and/or paper mill for Newfoundland has not been made impossible by this past summer forest fires, as has been reported elsewhere. Newfoundland Mines and Resources Minister W. J. Keough has stated that the forest fire damage has not been as great as was first feared.

Working on a forest survey in the province are a field staff of Newfoundland Pulp & Paper Co. which has been granted timber concessions in southern Labrador and for Crown lands on Newfoundland Island. The U. S.-backed company holds the concessions under an agreement with the government which provides the company must decide whether to build a mill before 1963.

Metropolitan TAPPI to Hear About Coated Papers

"The Future of Printed Coated Papers" will be the subject of a talk by Paul Thoma, Time, Inc., at the November meeting of TAPPI's Metropolitan District. Mr. Thoma, an outstanding leader in research and development on printing papers, is technical director of Time's Springdale labs. The meeting will be held November 14 at 6:30 P. M., at Stouffer's Restaurant, 100 E. 42nd St., New York City.

Annual Research Conf. Held at Mobile

The fourth Annual Research Conference of the pulp and paper industry was held on October 27 and 28. Sponsored jointly by APPA and TAPPI, the conference this year was at Mobile, Ala. Chairman of the conference was A. W. Plummer, director of industrial engineering, S. D. Warren Co., Cumberland Mills, Me.

Close to 50 technical representatives of the pulp and paper industry and 50 key scientists from colleges and universities gathered from all parts of the United States and Canada for two days of intensive discussion of important fundamental research opportunities for future study. Research in paper formation, wood pulping and chemical additives were a few of the many subjects covered.

The purpose of the conference was to provide opportunity for closer relations between paper technologists and key educators and scientists concerned with fundamental research.

Two West Coast Paper Merchants Merge

The merger of two West Coast paper merchant firms has been announced by Robert E. McJilton, owner of the Nelson Paper Co., Oakland, Calif., and Daniel K. Beswick, president of Bonestell and Co., San Francisco.

The merged organization is to be known as the Bonestell-Nelson Paper Co.

Mr. McJilton has been named vice president of the new company and general manager of the Oakland division. His son is manager of the Oakland division. Another son, Howard of Castro Valley, will be assistant manager.

Bonestell and Co., established in 1852, is the oldest paper merchant on the West Coast.

October 24, 1961

Lockwood Trade Journal Co., Inc.
49 W. 45 St., N. Y. 36, N. Y.
U.S.A.

Gentlemen:

We are manufacturers of woodfree printing paper and book printing paper and are interested in using waste paper as raw material instead of rice straw, bamboo, bagasse, etc., which we are presently using.

We note that in the July 31, 1961 issue of your journal, quotations on various kinds of waste paper were given on page 40. We are particularly interested in the No. 1 Soft White Shavings and the White Ledger, and shall appreciate it very much if you will introduce us to some source which we can contact for quotations.

We thank you in advance for whatevery courtesy you may extend in this regard.

T. S. King
General Manager
Darcon Paper Mfg. Co., Ltd.,
59 Hankow Street Section 1,
Taipei

PAPER PEOPLE

J. M. O'Donoghue

Ray Brown

O'Donoghue Promoted At Riegel Paper

Riegel Paper Corp. has promoted John M. O'Donoghue to the position of Mid-Atlantic regional pulp sales manager.

A graduate of Columbia University, Mr. O'Donoghue joined Riegel in 1956 as a sales representative. Most recently, he was supervisor-corporate product development on Riegel's marketing staff. Mr. O'Donoghue will be responsible for pulp sales in Ohio, western New York, New Jersey, Pennsylvania and Virginia.

CCA Names Drnec Manager, Solid Fiber Sales

Harry F. Drnec has been appointed as manager, solid fiber sales, for Container Corp. of America.

Formerly sales manager for solid fiber products in the Chicago district, Mr. Drnec will now direct and coordinate the company's solid fiber sales across the country. He joined Container Corp. in 1945 as a development engineer and later became plant engineer at the company's Ogden Avenue corrugated shipping container plant in Chicago. Subsequently, he directed the machinery development department and was named sales manager for solid fiber, Chicago district, in 1960. For the time being, Mr. Drnec will continue to make his headquarters at Ogden Avenue.

Eastex Appoints Brown A Vice President

Appointment of Ray Brown, resident manager at Evadale, as a vice president of East Texas Pulp and Paper Co., has been announced.

Mr. Brown has been resident manager of the mill since June. He has been associated with Eastex since April 1954 when he began work as superintendent of the pulp mill. Late in 1956, he was made assistant resident manager of the mill and last June succeeded A. G. Natwick, who retired, as resident manager.

A native of Fisher, La., Mr. Brown began work in 1925 at the Calcasieu Paper Co. in Elizabeth, La., and later moved to Oregon where he was employed by the Crown Zellerbach Corp. He became pulp mill superintendent of Crown Zellerbach's mill at St. Helens, Ore. After 23 years in Oregon, he returned to the East Texas area in 1954 several months prior to the start-up of the Evadale mill.

Strathmore Announces Three Promotions

Strathmore Paper Co. has announced the appointment of Albert W. Dempsey, as superintendent of the company's Turners Falls, Mass., mill. He succeeds Kenneth A. Sheridan, who has resigned from the company.

The company also announced it has named Romeo W. Marceau, formerly tour assistant superintendent of the Turners Falls mill, to succeed Mr. Dempsey as assistant superintendent. William Letourneau has been named tour assistant superintendent to succeed Mr. Marceau.

Ashby Returns to B. C. Offices of Westminster

Westminster Paper Co., Ltd., announces that John Ashby, executive vice-president, will again make his headquarters at the company's administrative offices in New Westminster, B. C. Mr. Ashby has been residing in Montreal for the past four years to direct Westminster's Eastern manufacturing expansion. He will continue to be responsible for the manufacturing operations at both the New Westminster, B. C., and Crabtree Mills, Quebec, plants in addition to his other duties.

H. F. Winchell and C. N. Hagar, managers of the New Westminster and Crabtree Mills manufacturing divisions respectively, will report directly to Mr. Ashby.

Georgia and Rome Kraft Name V-P and Gen. Mgr.

E. V. McSwiney has been elected vice president and W. M. Ebersole named general manager of production of Georgia Kraft Co. and Rome Kraft Co. at Macon and Rome. Georgia and Rome Kraft are owned jointly by The Mead Corp. of Dayton, Ohio, and Inland Container Corp., of Indianapolis, Ind.

Mr. McSwiney, who has been assistant vice president of Rome Kraft since 1958, first became associated with the paper industry in 1939 when he was employed by Mead in his home town of Nashville. During the intervening years, he has advanced to positions of added responsibility. In 1948 he transferred to Macon as office manager. Four years later (1952) he was named assistant controller of Rome Kraft, became controller in 1956, and was elected assistant vice president in 1958.

Mr. Ebersole's promotion to general manager of production for the Rome and Macon mills highlights a 14-year career which began in 1947 when he joined Georgia Kraft Co. as pulp mill superintendent. Before transferring to Rome earlier this year as manager of production for the Rome mill, he had served as general superintendent for two years and manager of production at Macon for seven years.

R. F. Hobbs

Hobbs Added to Con Can Multiwall Bag Sales Staff

Rupert F. Hobbs has been added to the sales staff for multiwall bags in the Paperboard & Kraft Paper Divisions of Continental Can Co. Mr. Hobb's territory includes Michigan, Indiana and Ohio, and he will operate out of his home in Cuyahoga Falls, Ohio. He comes to the company after experience with several other multiwall bag producers.

Continental manufactures a full line of multiwall bags at its Hodge, La., paper mill.

Barber Joins KVP Sutherland Division

Homer Barber has been named general purchasing agent for the Sutherland Division of KVP Sutherland Paper Co. He was formerly assistant director of purchasing for the American Box Board Division of Packaging Corp. of America in Grand Rapids.

Evans Moves to Rayonier Eastern Research Division

R. Stuart Evans has been appointed supervisor in charge of the fundamental section of the Rayonier, Inc., Eastern Research Division.

Dr. Evans joined the chemical cellulose and papermaking pulp producer five years ago. His current assignment is group leader of wood research at Rayonier Canada, Ltd., and he has been in charge of the program on wood research as it applies to saw mills.

Prior to his association with Rayonier, Dr. Evans was with the National Research Council, Saskatchewan. A native of Canada, he received his doctorate in chemistry from the University of Saskatchewan.

His headquarters are at Whippany, N.J.

C-Z Research Lab. Ups Gillespie; Adds to Staff

Announcement of the promotion of J. Frank Gillespie and of four additions to the staff of Crown Zellerbach's Central Research Laboratory and the Chemical Products division, Camas, Wash., has been made.

Dr. Gillespie steps up from research chemist to supervisor of Monomer research.

The scientist joined Crown Zellerbach last year. He is a graduate of the University of Alberta and earned his doctor's degree in organic chemistry from the University of Notre Dame.

He also holds a post-doctorate in theoretical chemistry from the University of Chicago.

Ralph Myers was named research chemist in the division's printing paper grades development group. Dr. Myers received his Ph.D. in physical chemistry from the University of Nebraska.

Paul Brunette joins the forestry research staff at the central lab as an associate forester. He holds a master's degree from the University of Michigan's School of Forestry.

Robert H. Gaps becomes a sales representative for Chemical Products after coming to the central laboratory as a research chemist in 1959.

Donald M. Blow was named research chemical engineer of the Chemical Products Division. He formerly was an associate chemical engineer at the Central Research Laboratory.

"Never heard of kraft or butcher's wrap but I'm pretty sharp on papyrus.

R. H. Mulford

Owens-Illinois Elects President

Ray H. Mulford has been elected president of Owens-Illinois Glass Co. He succeeds Carl R. Megowen, who was elected vice chairman of the board and chairman of the executive committee.

This action by the Owens-Illinois board of directors was announced by J. P. Levis, chairman, who said it was taken at Mr. Megowen's request and described it as a realignment of executive responsibility designed to strengthen the firm's top echelon.

Mr. Megowen has been president of Owens-Illinois since 1950. The post of vice chairman of the board, to which he was elected, is newly created. He takes over the chairmanship of the executive committee from Mr. Levis, who remains as chairman of the board and chief executive officer.

Mr. Mulford has been executive vice president of Owens-Illinois since October 1960 and was elected a director last July. He has had 28 years of continuous and widely diversified service with the company.

Mr. Megowen, Mr. Levis and Mr. Mulford will share responsibility in determining major policy.

Holderby and Moggio Get Industrial Waste Award

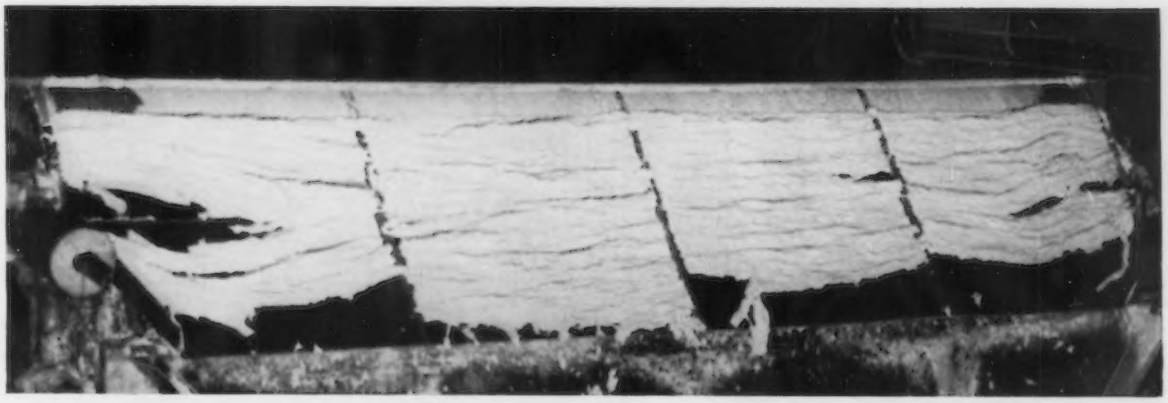
J. M. Holderby, manager, Lake States Yeast and Chemical Division of the St. Regis Paper Co., Rhinelander, Wis., and W. A. Moggio, section head, felt products research, Armstrong Cork Co., Lancaster, Pa., were honored with the Industrial Wastes Award at the recent 34th annual Water Pollution Control Federation meeting, Milwaukee, Wis.

Mr. Holderby graduated from the Montana State College in 1922 and later earned his MS from the State University of Iowa in 1924.

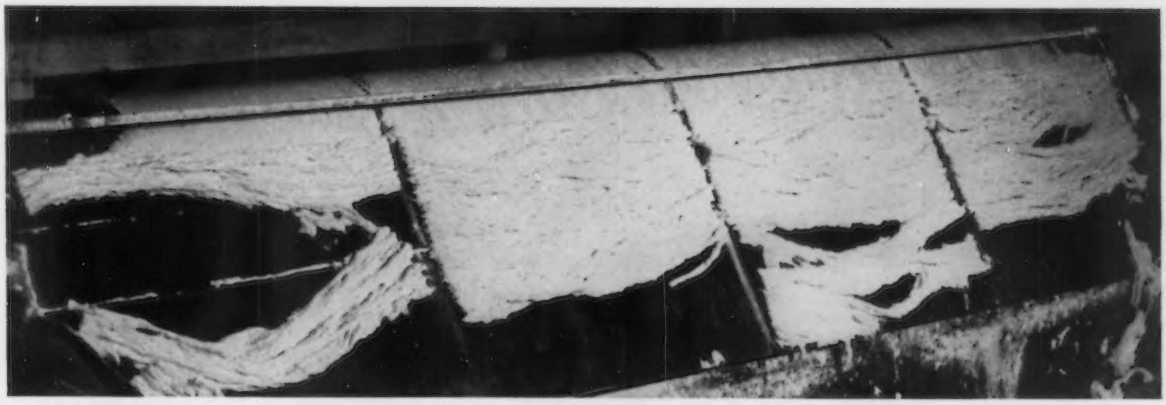
From 1925-30 he was a chemist

STOCK LIKE THIS IS TOO GOOD - TOO COSTLY - TO THROW AWAY

BIRD SAVE-ALLS



ARE SAVING IT FOR MANY MILLS AT LOWEST COST PER TON



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with the Sanitary District of Chicago, Ill., and assumed the duties as assistant sanitary engineer from 1930-37 with the Wisconsin State Board of Health, Madison, Wis. He then became superintendent of the Neenah-Menasha Sewerage Commission from 1937-40. From 1940-50 he was coordinator of research for the Sulphite Pulp Mfrs. Research League. From 1950-56 he was vice president and general manager of the Lake States Yeast Corp. In 1956 he assumed his present duties as manager of the Lake States Yeast and Chemical Division.

Mr. Moggio graduated from Rutgers University in 1938 with a B.S. in chemistry and earned his M.S. from the same university in 1939.

Mr. Moggio has been with Piatt and Davis and Associates as a sanitary engineer-chemist and the National Council for Stream Improvement as resident engineer in Baton Rouge, La. He has also been chief chemist with the East Texas Pulp and Paper Co., Evadale, and with the St. Regis Paper Co. as production manager.

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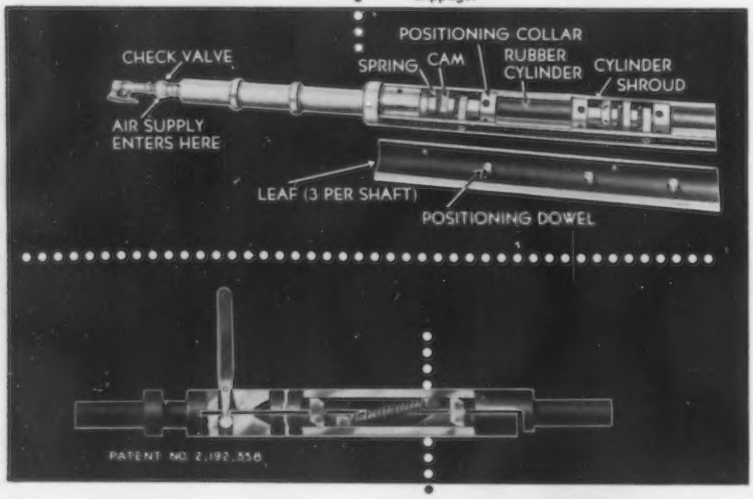
Murco - Collard SHAFTS

PNEUMATIC COLLAPSIBLE WINDER AND UNWINDER

Wind paper without chucks, mandrels, collars, wedges or keys or other accessories normally used for these operations. Simple rugged construction . . . few parts subject to wear. Shaft expands instantly by applying air. Shaft collapses instantly upon release of air . . . no loss . . . no damage to paper or cores. Leaves expand instantly to a true circle that provides complete contact with cores or paper throughout entire shaft length . . . no slippage.



CANNOT COLLAPSE WHILE WINDING . . . ABSOLUTELY FOOLPROOF. Can be used for both winding and unwinding paper. Milled out of light metals, MURCO Windershafts are adaptable for drum winding and slitters . . . will wind hard uniform rolls without distorting cores . . . easy to operate . . . speeds assembly of cores and reduces work fatigue . . . made to your machine specifications.

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FOR QUOTATIONS WRITE and send us your specifications for windershaft requirements . . . quotations without obligation.

D. J. MURRAY MANUFACTURING CO.
Manufacturers Since 1883 WAUSAU, WISCONSIN

KVP Sutherland Names Kribs to New Post

KVP Sutherland Paper Co. has announced the appointment of David Kribs as representative for its Specialties line in Virginia and the Carolinas.

Mr. Kribs, who has been with KVP Sutherland for 21 years, was formerly product manager for prepackaging boards and trays in the company's home office, in Kalamazoo, Mich.

Roberts Is Given Paper Mill Post

Columbia River Paper Co., has promoted Ken Roberts to the post of general superintendent of the Vancouver Division.

Mr. Roberts, who has been paper mill superintendent at CRP's Salem division, steps into a position which has been vacant for several years.

In papermaking since 1932, Mr. Roberts served with Potlatch Forest, Inc., of Lewiston, Idaho; and Weyerhaeuser Co. in Longview before joining CRP in 1958.

OBITUARIES

Dean F. Chase, 63, manager of the Canadian woods division of the Great Northern Paper Co., died suddenly October 27, at a Millinocket, Me., hospital. He had been employed in the forestry engineering division of the Great Northern Paper Co. for 39 years.

Weimar Cross, 60, died October 25 in New York City. He had been a director of the United Kingdom newsprint division of Bowaters Sales Co., Inc., since 1957.

Born in Pittsburgh, Pa., Mr. Cross first joined Bowaters 21 years ago as a member of the staff of the Bowater Paper Co., Inc., New York. He became a director in 1941 and at the time of his death was a vice president. He was also chairman of Bowater Paper Co., Pty., Ltd., and of Bowater Sales Co., Ltd.

C. Alfred Nobles, 58, International Paper Co. executive, died October 21 in a Georgetown, S. C., hospital after an illness of several hours.

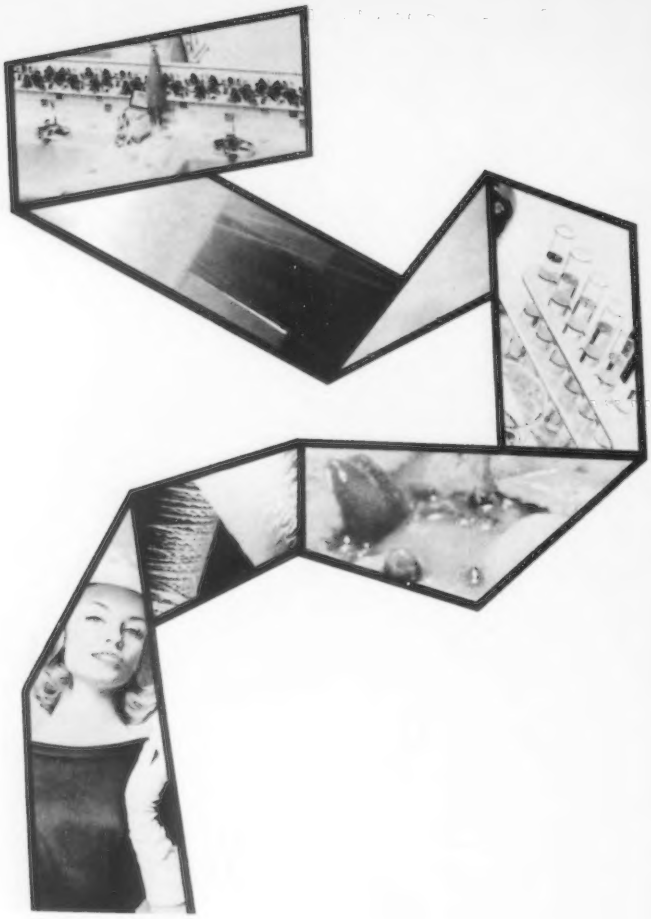
Mr. Nobles had been production manager of the Georgetown mill prior to being recently promoted to assistant mill manager.

things look better...

with DYLEX® latices in the paper coating

KOPPERS

With Koppers new series of latices in your coatings, paper has unexcelled printability. Clear, sharp, true-to-life reproductions. Turn the page and find out why!



things look better...

with DYLEX latices in paper coatings because they coat evenly without lumps or streaks. Type and illustrations will reproduce clear and sharp because the paper surface is smoother, more uniform, and pick resistant. DYLEX latices have excellent mechanical stability, less foam and less odor. They *blend* well with other paper coating additives and they're easy to apply. And they strengthen coated papers for today's modern high-speed printing presses.

Koppers produces DYLEX K-52 for conventional clay coatings; DYLEX K-54 for superior adhesive qualities; and DYLEX K-85 for specialty papers requiring extremely high gloss. For more detailed information on how these latices can make smoother, stronger paperboard coatings for you, write Koppers Company, Inc., Plastics Division, Dept. 169, Pittsburgh 19, Pennsylvania.

KOPPERS PLASTICS

Fabric and fashion illustrations courtesy of E. I. du Pont de Nemours & Co., Inc.

This insert is printed on Polar Offset Enamel—manufactured by Oxford Paper Company, a prominent user of DYLEX K-54 latex for paper coating.

DURASORB

Needled Felts

Every felt is designed to remove water, produce the right finish, and to provide maximum service in terms of durability.

Seven years of testing in every type of mill has proved that Durasorb needled felts improve performance in all three of these categories under certain conditions.

Improvement in felt performance has resulted in every type of papermaking. The extent of improvement has varied because of individual circumstances. But — in almost every instance where Durasorb felts are used — at least one major improvement in performance can be gained. Often dramatic improvement results in two or even three of the basic functions.

Albany Felt Company's pioneering in the development of needled felts has now brought us to the point where we can say with assurance: **Durasorb Felts designed for your particular machine and requirements can help you obtain IMPROVED EFFICIENCY, BETTER QUALITY, and INCREASED PRODUCTION.**

Talk DURASORB needled felts now with your Albany Felt Sales Engineer.

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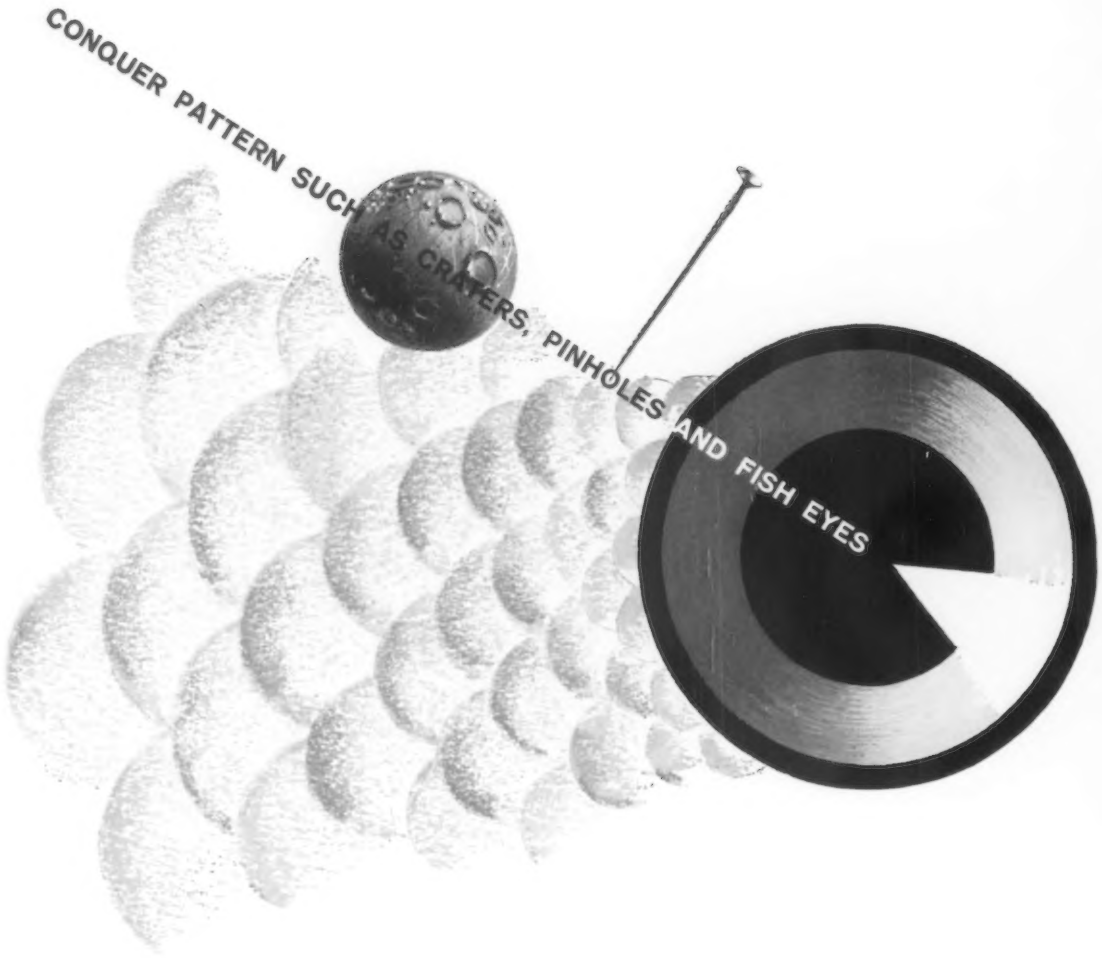

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Manufacturing Licensees Throughout the World

Management of Potlatch Forests, Inc., first examining the newly-installed IBM computer unit at its Lewiston, Idaho, paper mill in early September. Shown from left are V. V. Vallandigham, vice president for pulp, paper and converting; Edwin C. Rettig, executive vice president and general manager; Donald Keller, production manager, and Dwain M. Bates, instrumentation engineer.

First Computer Application On a Paper Machine

An on-the-spot report of this interesting new but still experimental installation at Potlatch Forest Industries, Lewiston, Idaho.

Last week we inspected the computer installation on the number one fourdrinier of Potlach Forest Industries. On this page we will discuss this installation in "Non-Computerese." For the benefit of our readers who may be interested in more technical details, data is presented on the next page.

At the present time the computer, an IBM 1710, is fed data from instruments located chiefly on the wet end of the paper machine and test results are dialed into it from the laboratory. The computer operates two wide carriage typewriters, one of which logs the instrument data and the other the test results from the laboratory. In addition the computer produces a punched tape containing all this data. This tape may be later fed back into the computer for study.

This is the extent of the computer operation at this time. It in no way controls the running of the paper machine at this time.

The above is a great over-simplification of this computer operation but it does present a picture of what is being done in this pioneering and enormously complex area. In the petroleum refining industry, where computer process control has made its greatest advances, it has been possible to reduce the process variables to mathematical equations. As our readers well know, we cannot prepare a formula for paper manufacture based on such essential variables as freeness, fiber length etc. In fact we even lack instruments to measure these variables in operation and have to depend on laboratory tests.

It is therefore only possible now to program a computer for paper machine control by a detailed study of previous data for grade runs. Since the data at present available is neither sufficiently detailed or accurate, the computer is now used, at this stage to collect and compile this information.

Later it will be possible to feed this back into the computer for analysis. Then it is hoped that it will be possible to use the computer to actually control some of the variables on the paper machine.

Ultimate Objective

Potlatch Vice President Vance V. Vallandigham said, "The company expects ultimately to compute signals in the 1710 system which will automatically control some of the points on the paper machine, in other words to form a closed loop system. We realize," he continued, "that some points can probably be closed in the near future but, on the other hand, some may never be closed. It must be recognized that the computer can only develop and produce data or facts from information that is recorded in its memory. Human judgment will always be required to handle exceptional operating decisions."

How the Computer Works at Potlatch

A semi-techincal discussion of the IBM 1710 installation

In 1959, Potlatch Forests, Inc., initiated a feasibility study on process control computers in the pulp and paper industry. On May 8, 1961, PFI announced its intention to install an IBM 1710 process control system on paper machine number one at its Clearwater plant in Lewiston. This announcement marked completion of Phase II of a six-phase project as follows:

Phase I.
- A. Feasibility Study
- B. Preliminary Cost Estimation

Phase II.
- A. Designing System
- B. Final Cost Estimate
- C. Writing Specifications and Ordering Equipment

Phase III.
- A. Writing the Initial Computer Program
- B. Physical Installation of the Equipment
- C. Debugging System and Program after Installation

Phase IV.
- A. Calibration of the System
- B. Gathering Data Generated by Process Instrumentation and Quality Tests

Phase V.
- A. Mathematical Analysis and Correlation of Data
- B. Upgrading the Initial Program

Phase VI.
- A. Additional Study for Expansion of the System

PFI and IBM have now (early November) completed Phase IV and are in the initial stages of Phase V.

What It Is

The 1710 process control system at Potlatch is an on-stream, open-loop, digital computer. The computer receives signals from process instrumentation located on and

Present Set-Up

The fourdrinier which is connected to the computer produces bleached kraft boards in a wide range of grades and weights. This machine, in fact, was said to average about 8 grade changes per 24 hours. Company officials state that one of the big advantages they expect to get from the computer is a large reduction in the time now lost in changing grades.

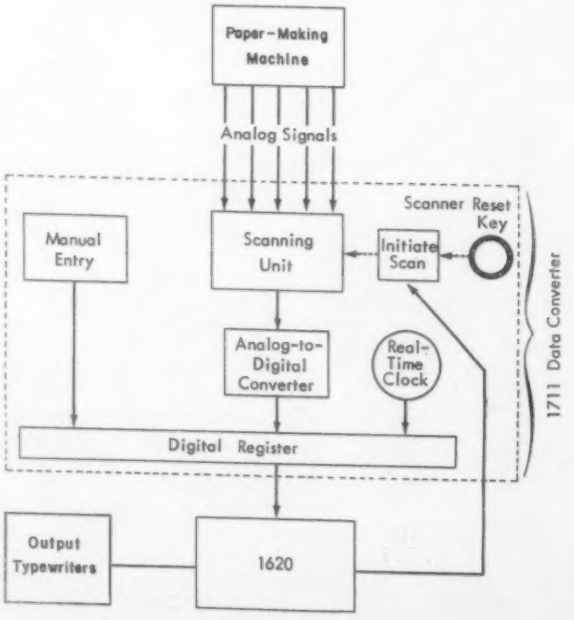
The computer system is currently connected to 46 points on the paper machine. Instruments supply information on such variables as; slice opening, pond level, wire pit temperature, sheet moisture, jordan amperes, alum and size feed, flat box vacuums press loadings, white water flow to fan pump, wire speed, etc. etc. Then as we indicated earlier, laboratory tests on the wet end and on the finished product are also fed into the computer. It is possible for some of the variables and tests to set up limits for these so that when the computer signals the automatic typewriters, if the data is outside the limits it is typed in red as a signal to the operators.

Potlatch Production Manager Donald T. Keller said, "Even in the initial phase of our computer installation, we have found it possible to log some process variables unavailable to us with conventional instrumentation. This is done by making on-stream calculations, using instrument signals as the data. In this way we exercise better control over known process relationships and minimize the effects of uncontrollable variables." An example of this is the velocity of the stock leaving the slice, which the computer calculates from data on slice opening, head, etc.

Conclusion

Although we have indicated that there is a long way to go yet for computer operation of a paper machine there is no denying that a big first step has been made. Undoubtedly more detailed information is now being compiled on the operation of a paper machine than has ever heretofore been available. The confidence of Potlatch in the outcome is shown by their decision to attach their second paper machine to the computer next year. Then looking further ahead they foresee the operation by computer control of the new continuous digester which they are currently installing.

Both I. B. M. and Potlatch are to be congratulated for their pioneering in this new field where there are so many complex problems.



prior to the fourdrinier. The system uses Minneapolis-Honeywell pressure-to-current transducers, transmitting a 4 to 20 miliamp signal.

Maximum distance of transmission is about 600 feet. The signals enter the computer room—a 16 x 20 foot air-conditioned enclosure—and are fed to a common terminal box which is wired to the 1711 data converter containing analog to digital equipment. The 1711 converts the 4-20 miliamp signal to a digital value in the range of 0000 to 9999. This value is read into the 1710 computer and the computer program scans and converts this value to the proper units, i.e., g.p.m., p.s.i., etc. During a log cycle, all instrument values are typed on a 24-inch carriage typewriter.

In addition to instrument signals from the paper machine, Potlatch is also transmitting test results from the paper test laboratory to the computer. This is done by a remote manual entry device. The test results from the laboratory are logged out on a separate typewriter.

A third typewriter is located on the console and is used for communication with the computer.

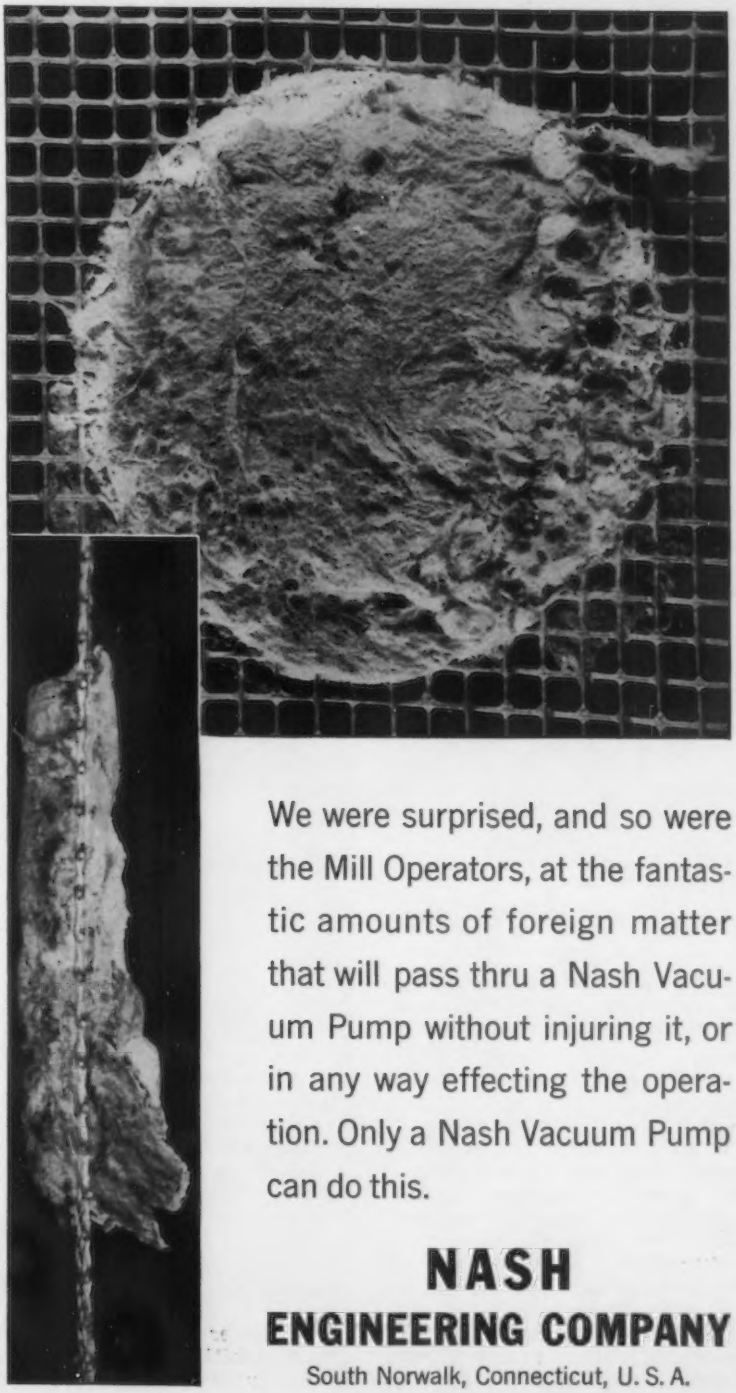
The 1710 system will, it is expected, eventually be tied into the paper machine at more than 200 points along the process line and produce information for the operators on a scheduled basis. This schedule can vary according to the operator's needs and the demands of the current grade run. The 1710 system reports to the operator via high-speed typing, and can pinpoint trouble spots in red. The operator can then make the necessary changes after evaluating, in the light of his own experience, the information he has received. At numerous points he will eventually be able to "close the loop" at his own discretion.

Ultimate Objectives

Ultimate objectives of the installation are as follows:

1. Predict quality test results while paperboard is being manufactured.
2. Provide operating guides for operators during grade changes.
3. Monitor the process during runs.
4. Produce a log sheet of all variables at ten-minute intervals.
5. Continuously scan instrumentation and log out in red any off-normal condition encountered during the run.

We put a screen on the intake of a Nash Paper Mill Vacuum Pump for a few hours...



We were surprised, and so were the Mill Operators, at the fantastic amounts of foreign matter that will pass thru a Nash Vacuum Pump without injuring it, or in any way effecting the operation. Only a Nash Vacuum Pump can do this.

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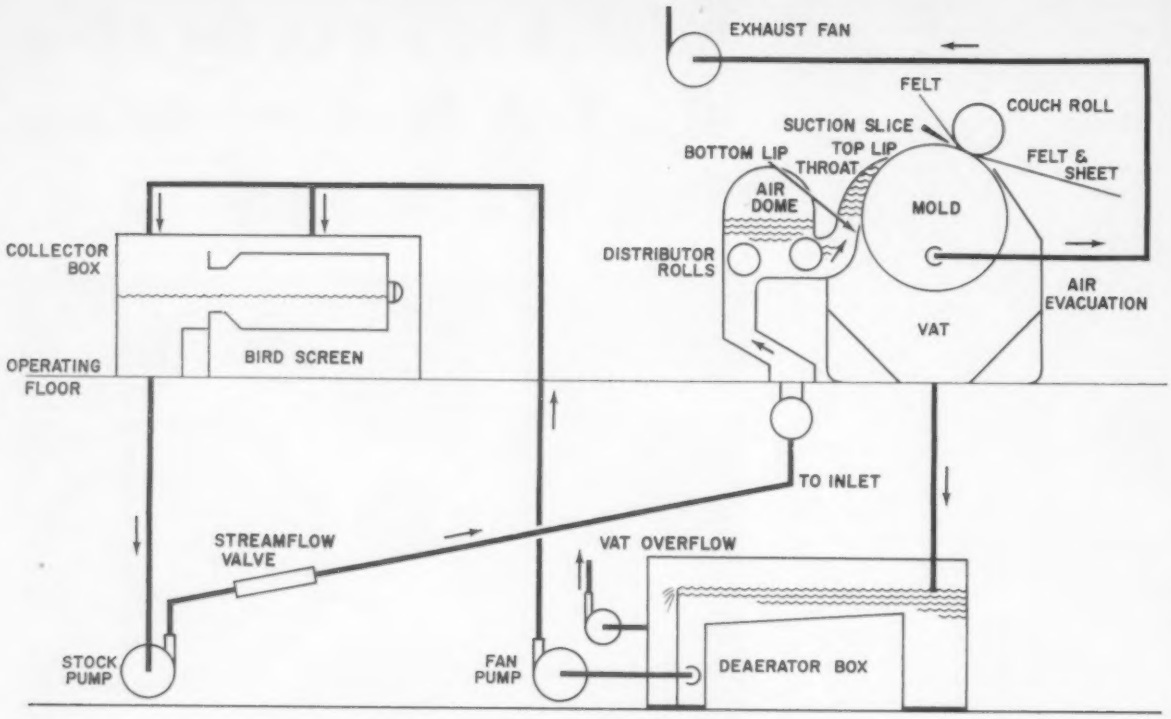


ABOVE SYSTEM SUPPLIES STOCK FOR STEVENS FORMER UNIT.

Stevens Formers Improve Top Liner on Multi-Cylinder Board Machine

Fibreboard utilizes two Stevens Formers together with six conventional cylinders on a machine producing folding boxboard. The units have shown to advantage in both economics and quality. Details are discussed below.

One of the really new developments of recent years in paper machines, the Stevens Former, has proven to be an outstanding success at Fibreboard Paper Products Corp.'s mill at Stockton, Cal. Utilized in the production of folding boxboard on No. 2 cylinder machine, two Formers have been installed for the top plys and have shown to advantage in both economics and quality of the board.

The first unit was installed about three years ago on No. 7 vat of the seven-cylinder machine. It was the first such unit to be installed on a multi-cylinder machine. Later Fibreboard added another Stevens Former unit on the same machine. It was installed in the No. 8 position.

The machine, originally a seven-cylinder machine, now an eight-cylinder machine, trims 113 inches and produces chip grades and folding boxboard in weight ranges of 63 lbs. to 136 lbs. per 1,000 sq. ft. Caliper of various types of board produced ranges from 15 to 40 points. Operating in a speed range of 150 to 320 ft./min., the machine's production is based on 125 tons/day.

Some of the reasons given by Fibreboard for using the Stevens Former are: that it saves liner, that it gives better formation and coverage. An additional benefit has been the ability to increase speed while producing a better quality sheet on the same grade.

Forming Unit

The Stevens Former, manufactured by Beloit, consists of a cylinder mold carrying both a backing wire and forming wire, mounted in a vat. But unlike a conventional cylinder machine, the vat does not contain stock in which the mold is partially submerged. Instead the stock under pressure is introduced to the cylinder through a specially curved throat conforming to the curvature of the mold.

The throat is part of what might

be termed a pressure headbox, being similar to that of a fourdrinier machine. Stock enters the headbox, which incorporates two distributor rolls and an air dome, through a manifold piping arrangement. The area of throat opening is adjustable and is bounded by a bottom lip and top lip. Both lips can be adjusted for distance from the forming wire. Due to the speed of rotation of the cylinder mold, no stock flows down through the bottom lip opening.

A web is formed almost immediately on the mold face in a distance of perhaps seven to ten inches, and as the cylinder continues rotating, the web is picked up by the felt which already carries the first six plies from the conventional cylinders. White water passes through the forming wire and flows by gravity to a collecting tank in the basement.

VACUUM SLICE just ahead of couch prevents fibrous material and water from collecting.

Operation of System

Fibreboard uses blends of bleached kraft sulphite, hardwoods and softwoods on No. 2 cylinder machine and stock is brought to the Stevens Former vat system at 3 per cent consistency. Major components of the vat system, besides the cylinder and vat itself are the stainless steel deaerating vat, the fan pump, screen, stock pump, stream flow valve, distributor rolls, and the stock inlet.

Stock is brought into the system through a stuff box and flows to a vibrating screen as the screened stock flows by gravity into a collector box in which a constant level is maintained by an automatic valve. This controls the amount of white water being brought into the system and maintains the desired head for the stock pump which has a capacity of 3,000 g.p.m. at 20 ft. head.

Stock is pumped through the stream flow valve to the stock inlet and throat of the Stevens Former at a rate controlled by the stream flow valve. The stock ejected from the throat under pressure is formed almost immediately into a web on the cylinder mold and continues on around the cylinder to be picked up by the felt and carried on to the next vat. The white water, aided in its passage through the wire face of the cylinder by a vacuum of 0.3 in. H_2O, flows to a deaerating vat in the basement. As the web is formed on the cylinder a puddle of pulp slurry is maintained just above the top lip of the slice. This also overflows to the deaerating vat. Excess white water from the vat is moved by a 450 g.p.m., 55 ft. head vat overflow pump to white water storage. The fan pump which has a capacity of 3,200 g.p.m. at 28 ft. head draws white water from the deaerating vat and pumps it back to the screens for dilution of the incoming stock, and to the tank above the stock pump suction for level control.

Significant Points

One of the points to note about the operation of these units is that Fibreboard always runs them with an overflow or a puddle at the slice and this overflow is returned to the deaerator box near the fan pump suction. Formation suffers in case the overflow is eliminated. Another point is that the cylinder is almost completely sealed against atmospheric pressure by the surrounding vat enclosure and the cylinder of the Stevens Former is under a slight vacuum. Normally Fibreboard carries this at about 3 in. water. Also noteworthy is that the air dome preceding the throat is under pressure in order to cut down surges and to maintain a uniform flow to the cylinder. A positive pressure of about 40 inches water is carried here.

DEAERATING BOX in basement. Flow distributor with multiple inlet pipes leads to Stevens Former unit above.

The opening at the bottom lip has been stabilized at about $\frac{5}{8}$ in. distance between the lip of the throat and the cylinder forming wire. This is sometimes adjusted slightly to rectify formation, but ordinarily it is held constant at $\frac{5}{8}$ in. The top lip of the slice is also adjustable; operating with a gap of 150 in. between this lip and the cylinder face. The unit is not completely sealed against atmospheric pressure. The shield which almost encloses the cylinder has $\frac{1}{4}$ in. clearance between it and the face of the cylinder.

Each of the Stevens former vats has two distributor rolls which aid in formation. Both rolls are driven from a single motor. Each unit is also equipped with a vacuum slice just ahead of the couch roll so placed to prevent fibrous material and water from collecting. Provisions had originally been made to drive the Stevens Former cylinders, but this has been found unnecessary and even the drive components have been removed. Within the vat, high pressure showers operating at 200 p.s.i. are used to keep the cylinder clean. These are said to be extremely necessary, otherwise poor, spotty formation will cause shutdown within minutes. Incidentally, the consistency used in these formers is more dilute than in their conventional vats. Generally the consistency ranges from .1 to .3 per cent.

Formers Have Proven Valuable

Fibreboard people feel that the Stevens Formers have been highly valuable in their particular type of operation.

"Our installation of Stevens Formers has given us the ability to run faster on higher grades, using less liner with resulting economies" states R. G. Beauregard manufacturing manager, Board Division Fibreboard Paper Products Corp.

Coating Demands Versatility in Handling and Preparation Equipment

The variety of coating requirements and the need to keep pace with new developments call for a versatile system.

William G. Farin,
Chemical Materials Handling Engineer,
Neenah, Wis.

Vast improvements have been made in recent years in surface finishing of paper and board largely through the development of paper coating techniques. There are a variety of coating methods used, one of the most successful being the trailing blade coater in which the coating is wiped on the paper by flexed steel trailing blade. This fills the voids and wipes off the high spots providing a smooth dense film with a minimum of coating application.

Coating requirements differ in accordance with the end use of the product. Various methods of printing require somewhat different surface characteristics; the extent paper must be worked also affects requirements.

These different demands and the constant development by a large number of companies account for the variety of methods used in processing and handling coating materials. The handling and preparation equipment provided must be versatile to meet the variable demands and to keep pace with new developments.

The main ingredients in the coatings are the fillers used, such as clay, calcium carbonate or titanium dioxide. Another highly important ingredient is the binder used. Rubber latex binders have been used quite successfully in coating and a wide variety of such materials is available from a number of manufacturers. Starch is also used in many cases as the coating binder.

Besides the binder, ingredients may include: a dispersing agent for the binder, a dispersing agent for the filler, an alkali to control the pH of the coating, a slimicide to retard bacteria growth or spoilage which can give a bad odor to the sheet, a defoamer to prevent foaming during mixing and application and water as a carrier to make the coating fluid.

Stabilizer preparation mix tank is agitated by turbine unit powered by variable speed drive. Tank is filled through dump hatch and exhausted to central scrubber. Alkali holdup and measuring tanks are located behind mixer.

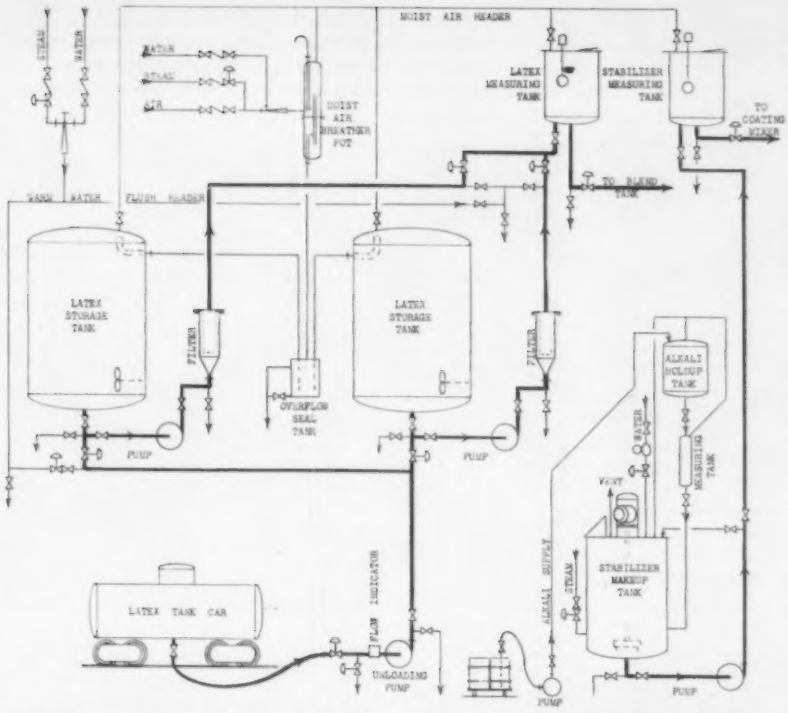
Preparation Requirements

Most of these ingredients can be prepared preliminary to the batch of coating and added in the coating batch as a single prepared stabilizer solution. To prepare these ingredients a stabilizer mix tank is provided with capacity to prepare 5 to 10 batches of coating. A two speed agitator is desirable with the high speed used during preparation and the low speed used for storage. The mix tank should have a bag dump hatch and an exhaust to the central dust scrubber. A metered water supply is provided and a steam sparger for cooking.

Where liquid ingredients are used for the alkali an elevated storage tank and small measuring tank may also be desirable. The stabilizer pump is used for recirculation during preparation and for transfer to a stabilizer measuring tank provided at the coating mixer.

Controls used for stabilizer preparation require only start and stop buttons on the pump and agitator and a speed selector for the agitator. The water meter has a preset with start and stop buttons. The steam is temperature controlled. A level indicator is necessary for the stabilizer tank indicated at both the stabilizer and coating makeup panels.

The stabilizer preparation tank can be remote from the coating mixer as they are separate operations. It may also be used to supply a number of mixers through separate measuring tanks which also provide the holdup time necessary for stabilizer preparation.



Flow diagram showing typical stabilizer preparation and bulk latex handling systems supplying measuring tanks in coating makeup area. Latex unloading and flushing system are automated to prevent product loss or spoilage. Measurement of latex and stabilizer solutions is automated from coating makeup panel.

Special Care in Handling Latex

The rubber latex binder used in coating is similar to that used in rubber base paints. It has many unusual characteristics which must be taken into consideration in providing handling equipment. It is supplied in water solutions and is of fairly high viscosity. Although it can be pumped with centrifugal pumps, efficiencies are low and pipe lines must be large to reduce pressure drop. It also breaks down when subjected to excessive shear, forming a gummy deposit which must be filtered out. It must be protected from freezing but cannot be subjected to high temperatures so hot water, not steam, is used in tank coils or jackets. Care must also be taken to prevent latex from drying out as it solidifies into a hard product which is very difficult to remove from equipment. It is therefore desirable to prevent extended contact with dry air by keeping surfaces covered with latex, washing equipment immediately after use or by blanketing equipment with moist air.

Because of the desirability to maintain high solids concentrations in coating applications, care must be taken to make sure there is no water dilution of the latex in storage or handling.

Latex is made available in drums but where usage rates are fairly high considerable savings are possible in product costs and handling when obtained bulk in tank cars. The latex can be pumped using a diaphragm pump or a centrifugal with propeller type impeller to minimize shear. The latex is pumped from the bottom of the tank car and enters the bottom of the storage tank so that it does not drop through air on entering the tank.

Prevent Contamination

Pumps and piping are fabricated of stainless steel to prevent contamination and facilitate cleaning. Storage tanks can be steel with phenolic or epoxy-phenolic lining with stainless steel nozzles. Where usage is steady, two storage tanks are desirable to facilitate periodic cleaning. Some agitation is desirable in storage and this may be provided by a slow top entering agitator or periodic agitation by a standard side entering unit operated about 15 minutes per shift when latex is being used.

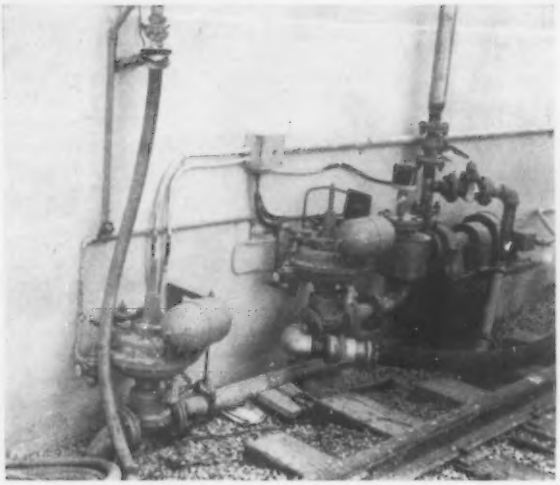
From the latex storage tank the product may be pumped with the same type pump through a strainer, provided with warm water back flushing facilities, up to a latex measuring tank located in the coating mixing area. Warm water is continuously available for flushing and washup in the coating mixing area from the steam heated pipe line heater.

A moist air supply system is also provided to blanket the latex storage, measuring and coating makeup tanks to prevent the latex or coating from building upon the equipment walls. The breather pot is designed to normally provide a small supply of warm moist air under a few inches of water pressure to prevent any dry air from entering the system. It will also break a vacuum or pressure buildup that exceeds 10 inches of water pressure.

Controls Prevent Latex Loss

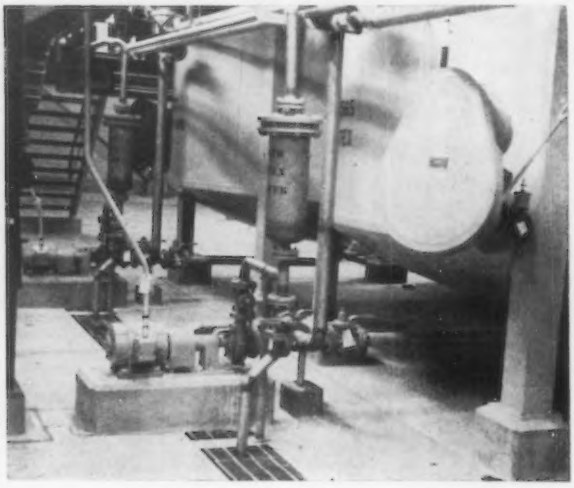
Due to the high cost of the latex, it is highly desirable to provide the necessary controls to prevent loss of product, spoilage or dilution in unloading, storage or handling. Automation includes a flow indicator and control valve in the unloading pump suction line, a selector switch for on-off-automatic for the pump, a selector switch for two storage tanks and a control valve for each storage tank inlet. With the tank car connected and vented, the pump on automatic and the proper storage tank selected, unloading can be started by pushing a start fill control button. When the flow starts the flow indicator light goes on, the proper control valves go full open. Flow may be stopped by the stop fill control button, a high or overflow level indication on the storage tank or if the flow indicator detects a flow stoppage such as when the tank car is empty. When flow stops, the automatic valves close and the pump automatically shuts off so there is no back flow of latex nor churning of latex in the pump which could otherwise cause a breakdown of the latex. This minimizes the formation of gummy deposits on equipment and filters.

Another desirable feature to prevent water dilution of the latex is an automatic flush system. This requires only the pushing of the flush button and valves close to the storage tanks and open to the tank car. A valve opens from the warm water supply system and back flushes the unloading transfer line back into the tank car for a timed interval. At the end of this period the warm water valve closes and the drain valve opens at the tank car, draining the car and the cleaned piping system. In addition to the operating convenience, it insures the cleanup of piping without



Latex unloading station outside wall of preparation building supplies storage tanks in building. Pump is automated with suction and drain valves and flow control unit for automatic shutdown and automatic flushing.

Two latex storage tanks with pumps and side entering agitators. Product is piped through filters to measuring tank. Filters are provided with warm water back flush piping.



In back of latex storage tank is moist air breather pot which supplies moist air to latex storage and measuring tanks, stabilizer measuring and coating tanks. Moist air is bubbled through temperature controlled water to provide moist air at operating temperatures.

the possibility of water dilution in a storage tank which could ruin a tank of expensive latex.

On the latex storage tanks, diaphragm type level indicators are desirable. A timer is provided on the side entering agitators which shut them down automatically after 15 minutes of agitation. The storage tank discharge pumps are controlled at the coating makeup panel by a switch selecting the tank to be drawn from and a start fill button for the measuring tank. The pump may be stopped by the stop fill button or shut off by a preset level control on the measuring tank.

Back flushing of the latex supply line and the strainer is by hand operation. The warm water supply header is valved to permit drainage after use so no water dilution can be encountered during normal operation due to a leaky valve.

These makeup and handling systems place the binder and stabilizer solution in measuring tanks in the area of the coating makeup system. This facilitates coating makeup and enables maximum use of expensive coating mixing equipment.

Where starch is used as a binder the makup and cooking facilities can simulate the stabilizer preparation system. Where starch is one of the primary ingredients, the setup can simulate the size press starch cookers covered by a previous article (See Paper Trade Journal Oct. 30, 1961). Where quantities warrant it and requirements are fairly constant a continuous cooker may also be used.

Bulk Handling Warranted

The quality and characteristics of the coating depend largely on the main ingredient which is usually the coating filler. This filler may be a fine or coarse grade of clay or calcium carbonate or a combination including other ingredients such as titanium dioxide to meet special requirements. Where coating is extensively used the usage rates on the main fillers warrant bulk handling. Clay and calcium carbonate are supplied in railroad hopper cars and can be unloaded into silos by pneumatic conveying as covered previously. They are preferably handled dry for flexibility and to enable preparations of maximum solids.

Bulk handled fillers can be stored in steel silos, epoxy lined to prevent contamination. The silo discharge should have at least a 60 degree slope to an opening of six square feet minimum area discharged by a screw conveyor. For fillers that have a tendency to set up or bridge, such as in the case of some grades of calcium carbonate, an eccentric cone bottom will facilitate discharge as one straight side removes one of the bridge supports.

Additional removal facilities may be necessary for removing calcium carbonate if it bridges over the removal screw of the discharging conveyor. Just as the air lance is successful in breaking up the product

during unloading, a series of air inlet connections can do the same in the silo. A short blast of air in nozzles properly placed will break up the bridge and provide flow to the screw. Voids can develop at the air inlets reducing their effectiveness unless the air blast is followed by a short silo vibration which will settle the contents back into the voids created so the next air blast will be effective. The air blast and vibrator sequence can operate on a timed sequence set to meet unloading requirements and can be energized along with the unloading screw conveyor.

Conveying the material from the bottom of the silos to weighing facilities is another application in which a pneumatic system is well adapted. It enables making up batches from any of the silos as required or proportioning any combination of ingredients to a weigh hopper direct from silo storage. It eliminates the need for intermediate storage of dry materials which would add to capital costs. It also reduces operating cost, maintenance and the downtime that are all a part of the additional equipment.

The best insurance against production loss due to bulk system breakdown is an auxiliary addition point for bag materials. This is also desirable to take care of small quantity additions or for use in making up coating with experimental fillers.

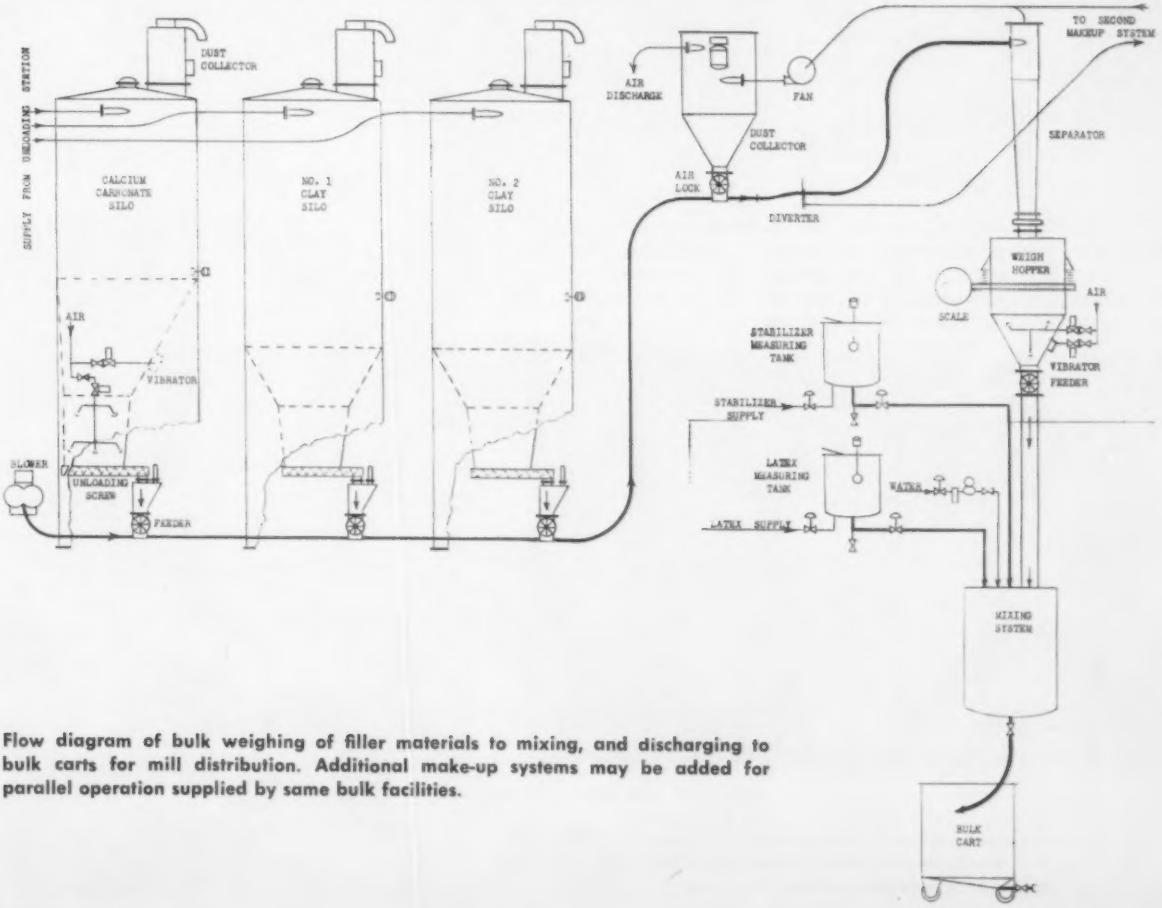
Removal from Bins

The bulk handled fillers are removed from the bins by the screw conveyors which supply the pneumatic star feeder. A constant displacement blower pushes the conveying air through the star feeder valves at all silos supplying coating makeup ingredients. Product is conveyed only from the silo in which the screw conveyor and star feeder are in operation. The conveying air picks up the product and conveys it pneumatically to a separator which discharges through an air lock into an aluminum weigh hopper sized to weigh out one full batch of coating filler. The conveying air is discharged by a fan through a dust collector with the collected product dropping directly into the weigh hopper.

Where more than one weigh hopper is used, the conveyed product goes through a diverter directing the product to the separator supplying the proper weigh hopper. In this case the product drops directly into the hopper and the air is discharged by the fan to a common dust collector. The collected product is dropped through a star feeder and is picked up by the pneumatic conveyor in front of the diverter directing it back to the separator and weigh hopper.

Automated Conveying Systems

The conveyor systems have compensators on the weighing setup to shut off the silo conveyor and feeder valve just before the desired weight is reached. The conveyor and dust collector remain in operation temporarily allowing them to clear themselves of product and bring the weigh hopper up to the preset weight. In this way contamination between batches is held to a minimum. The batch may be drawn completely from one silo or a weighed quantity from a number of silos may be drawn in sequence to provide a mixture of fillers as prescribed by

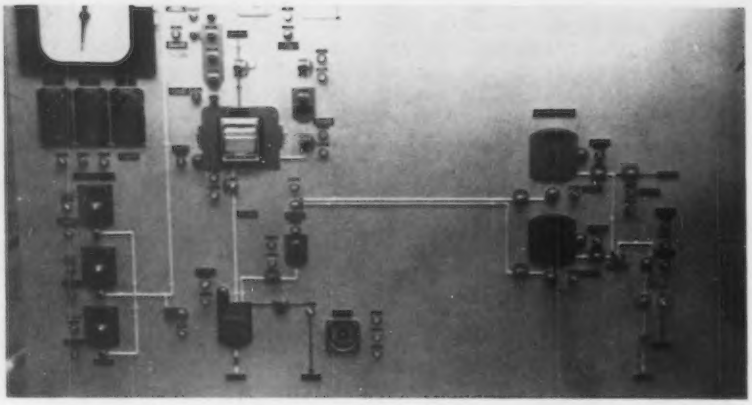


Flow diagram of bulk weighing of filler materials to mixing, and discharging to bulk carts for mill distribution. Additional make-up systems may be added for parallel operation supplied by same bulk facilities.

the coating specifications.

This is readily accomplished by an automated conveying system which includes a weight selector for the product from each silo, a compensator for each silo, and a weight indicator and recorder. This allows setting the weight to be taken from the first silo, the total weight after removal from the second silo, the total weight after removal from the third silo, etc. Each silo has in-out buttons so it can be by-passed if desired, automatic-off-on buttons permitting automatic or manual operation, indicator lights for the discharging equipment and low level indicator lights. Automatic-off-on buttons and indicator lights are provided for the conveyor blower and the dust collector system. The weigh hopper has empty, filling and filled indicator lights.

There are also start and stop buttons with indicator lights for automatic operation. With all equipment on automatic and the silos weights and compensators properly set, pushing the automatic start button starts the blower and filter and then the feeder equipment from the first silo. Removal continues until the compensator shuts off the feeder equipment and allows time for the system to clear and record the amount removed from the first silo before automatically starting the feeder equipment on the second silo. The same procedure is followed to the third silo, etc. until the complete batch is weighed out involving removal from one or any number of silos.



Coating ingredient supply system graphic panel has recorder for filler weigh hopper in upper left hand corner. Below are selector stations and compensators for silos handling calcium carbonate and two grades of coating clay. Silos with controls are graphically seen at lower left with the white conveying line going up dust collector discharging to weigh hopper to mixer. Water inlet meter and stabilizer measuring tank can also be seen discharging to mixer. Mixing system is also supplied by bulk latex system at right through measuring tank.

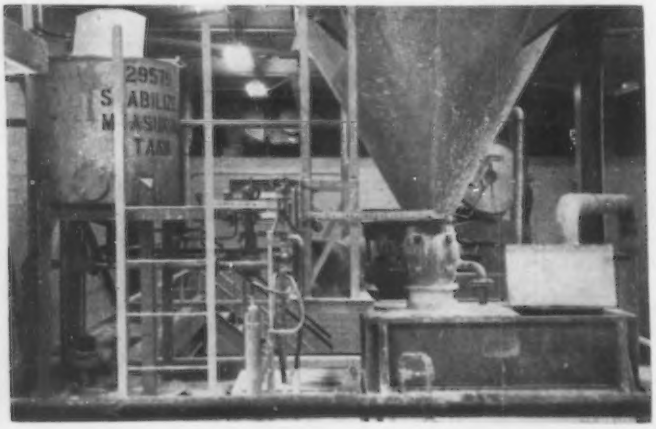
Weigh Cycle Can Be Pre-Set

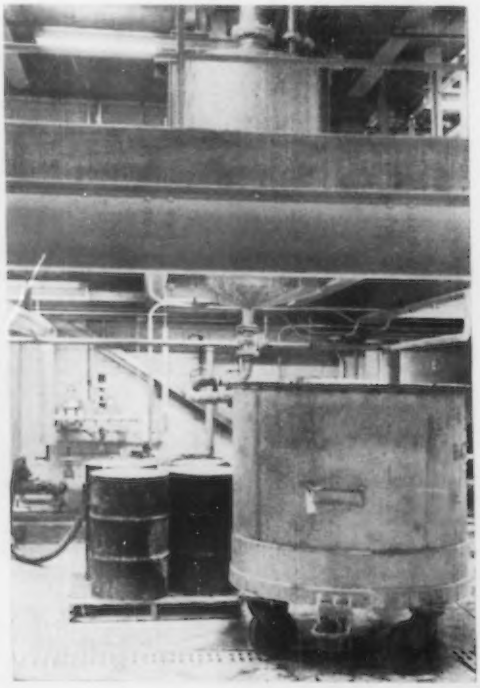
This weigh cycle can be completed in 10 to 15 minutes and may be set up previous to the required batch of coating along with filling the stabilizer and latex measuring tanks so that all materials are readily available previous to starting the coating preparation.

The weigh hopper can discharge through a 60 degree cone bottom and be provided with a vibrator and air purge connections in a timed sequence to remove any bridging encountered. Discharge is controlled by a star valve powered by a variable speed drive.

Mixed coating can be transported by circulating loop or by bulk carts designed to carry a full batch of coating. By processing and transporting each batch separately, it is possible to meet the demands of different coaters and any number of coaters can be supplied to the limit of the mixer capacity. When capacity is exceeded a parallel mixing unit can be installed using the same bulk supply systems.

Central coating measuring facilities with overhead weigh hopper discharging through star feeder with variable speed drive. Stabilizer measuring tank is at left directly over latex measuring tank which discharges to mixing system. Bag materials can be dumped directly into mixing system through dump hatch seen at right.





Prepared coating is dropped from mixing system into bulk cart equipped with quick connecting trailer hitch and pulled by lift truck to coater stations.

Hot Stock Screening Examined In Depth By Alkaline Pulpers

Caustic cookers convene in cow country (Houston, Texas) and give black stock screening the spotlight, hear about new control methods, pulping of outside stored chips; many other topics. An extra session on sulphite pulping was included.

Harry Dyer,
Associate Editor,
Paper Trade Journal

Just concluded in Houston, Texas, was another successful TAPPI alkaline pulping conference — the fifteenth—held at the Rice Hotel on November 1-3.

Highlight of the three-day meeting was a panel composed of seven members from industry and two from suppliers discussing their experiences with "black" (hot) stock screening. Each member of the panel summarized such items as equipment and equipment layout for black stock screening, its operation, soda reduction, effect on effluents, tonnage through-put, stock cleanliness and operating problems. Results of this panel session are discussed in greater detail further on in this report.

The complete program, like that of previous years, was comprised of three sessions on alkaline pulping and one session on sulphite pulping. T. T. Collins, Jr., Packaging Corp. of America, was program chairman for the alkaline pulping program and Everett D. Cann, of Charles T. Main, Inc., arranged the sulphite pulping portion.

David Wetherhorn of W. C. Davis Associates was general conference chairman, and J. O. Parrott, Champion Paper & Fibre Co. was local arrangements chairman. Mr. Parrott was assisted by J. Pound, also of Champion.

Three mill tours were arranged for the conferees as the third day's activities: one at Champion Paper & Fibre, in Pasadena, Texas; another at East Texas Pulp and Paper Co., in Evadale; with the third at Southland Paper Mill, in Lufkin.

The conference is sponsored by both the Alkaline Pulping Committee and the Sulphite Pulping Committee, each a part of the Pulp Manufacture Division. J. P. McGovern, Parsons and Whittemore, Inc., is division chairman with J. H. White, Keyes Fibre Co., vice chairman.

D. Wetherhorn, W. C. Davis Associates, general conference chairman

P. H. West, Thilmany Pulp & Paper Co., vice chairman of Alkaline Pulping Committee

D. Wetherhorn is chairman of TAPPI's Alkaline Pulping Committee; vice chairman is P. H. West, Thilmany Pulp & Paper Co., and R. R. Fuller, Gulf State Paper Co., is secretary.

P. E. Trout, Waldorf Paper Products Co., is chairman of the Sulphite Pulping Committee, with P. J. Frost, Crown Zellerbach Corp., as vice chairman. E. L. Smith, Combustion Engineering, Inc., is secretary.

Total number of registrants at the meeting was nearly 400, down from last year's conference.

Resume's of some of the technical papers read at the conference follow.

High Speed, Continuous Pulping of Softwoods

The feasibility of the continuous pulping of softwood species in a short time cycle were investigated in a pilot plant unit by Black-Clawson. The results were reported to the meeting by Wayne F. Carr of B-C (paper co-authored with D. G. Sutherland).

The Pandia continuous digester had a three tube assembly and screw feeder with a 1.5 to 1 compantion ratio. A pretreatment tube was installed to operate at 100 psig with 1 to 5 minute retention. Each tube had a separate liquor circulation system.

All indications tend to show that softwood bleaching grade pulps can be produced in less than 30 minutes, and possibly in 15 minutes, which have improved properties and greater uniformity than that received with present day methods.

Some results when cooking East-

ern white pine reported were:

- Short bring up periods to temperature do not seem to be detrimental to yields, strengths and screening.
- Cooking rate increases rapidly with only slight changes in active alkali as the maximum temperature is increased. If temperature, concentration, or wood vary to any degree without adjusting the time in higher temperature ranges, a completely unsatisfactory pulp may result. Maximum temperature and pressure to 190 p.s.i. did not tend to lower carbohydrate content of the pulp.
- Sustained active alkali concentration levels above 35 g.p.l. tend to degrade pulp strength at all temperatures; below g.p.l. active Na_2O tends to increase tear and lower Mullen. Freeness increases with higher sustained active concentration. High concentration levels give appearance of alpha-type pulp; best results occur with lower liquor concentration, even independently of maximum temperature levels. Too low, however, leads to poorer strengths.
- Screening rejects are not excessive up to 180 p.s.i. and without pre-treatment; 170 and 190 p.s.i. cooks begin to give slightly high screening levels. On southern pine chips without pre-treatment, 8.9 per cent screening rejects resulted when cooked to 150 psig. With pre-treatment, rejects were lowered. With a combination of pre-steaming and Anglo chip (produced by Anglo-Canadian's drum type chipper), per cent rejects were lowered to acceptable level.

R. A. Somsen, Olin Mathieson Chemical Corp.; T. T. Collins, Jr., Packaging Corp. of America; R. F. Cashen, Jr., P. H. Glatfelter; W. F. Carr, Black-Clawson; R. R. Chase, Union Bag-Camp.

Pulping Outside Stored Chips

Roger A. Somsen, of Olin-Mathieson's West Monroe, La., mill, described results of kraft pulping of southern pine chips stored in outside piles.

Two test piles of chips were constructed each consisting of 220 cords of fresh sawmill chips. One pile was constructed in May 1959 and evaluated by pilot plant techniques for one year. The second pile was constructed in May 1960 and also evaluated for one year. The second pile, however, was wet with water during construction on the theory that such wetting would reduce drying out of the pile during storage and thereby result in decreased chip deterioration.

The maximum temperatures reached were 145° and 129°F and the average temperatures were 139° and 115°F for Pile Nos. 1 and 2 respectively. The pile temperature differences are the result of wetting during construction.

Losses of turpentine and tall oil amounted to 80 per cent in 30 weeks. The rate of tall oil loss is very rapid, amounting to 53 per cent in four weeks after which the rate decreases until it is essentially constant after 20 weeks. Turpentine content did not change during the first seven weeks of storage, but then decreased rapidly until 28 weeks after which it remained constant.

The formation of carbon dioxide in Pile 2 during the period of tall oil loss indicates a possible chemical and/or biological oxidation of this material or other materials during this period.

No significant changes in active alkali requirement to 26-28 permanganate number were noted for either pile. Yield levels also show no significant change with storage time. Rejects level was higher in No. 1 at all times because of higher chip consistency. Pulp viscosities were found to vary widely. Although pulp brightness remained constant for 32 weeks on Pile 2, an unexplainable rise was found at 48 weeks.

Significantly faster beating rates were found for both piles at 31 weeks of storage. (Since all cooks were made to 26-28 permanganate number range degree of cooking will not influence results reported.)

Mullen-tear and tensile tear show that strength losses were smaller in wetted Pile 2 than in unwetted Pile 1. Loss in strength for both piles was found to be a loss of tear since maximum mullen and tensile development were not affected. Initial tear was significantly different at 17 weeks for Pile 1 and at 28 weeks for Pile 2 illustrating the advantage of wetting the storage pile for pulp strength retention. No changes in freeness were found over the storage period, discounting earlier works that the decrease in tear was the result of damage to the fiber during blowing and handling and, hence, a lower freeness.

The improvement in pulp strength retention by wetting the storage pile is the reverse of reported results on pulpwood storage. This effect may be the result of the elevated temperatures reached early in the chip storage period, resulting in a degree of sterilization.

Based on these results and a maximum storage time requirement of 16 weeks a new woodyard has been installed in which all of the wood inventory at the pulp mill is in the form of chips.

Two-Stage MgO Pulps

At the sulphite pulping session Earl L. Bailey, of Weyerhaeusers' Cosmopolis, Wash., mill described two new magnesium-base two-stage sulphite pulping processes developed by Weyerhaeuser and Howard Smith Paper Co.

The new processes provide a wide spectrum of sulphite pulps ranging from a low alpha fast hydrating pulp to a high alpha, long beating pulp. Development work on the two new processes has been performed in the research departments of both companies and has resulted in the production of a wide panorama of sulphite pulp grades. The manufacture and characteristics of the two-stage cooked pulp, an entirely new innovation in North America, were fully detailed in the October 30, 1961 issue of Paper Trade Journal.

Three other papers read at the sulphite pulping session were:

Carbohydrate Changes and Related Physical Effects in Full Chemical Pulping, by N. S. Thompson, E. F. Thode and J. R. Peckham of Institute of Paper Chemistry; **The Role of Carbonyl Groups in the Sulfonation of Spruce Wood Lignin,** by P. Luner and H. P. Gore of N. Y. State College of Forestry; and **Solubility and Neutralization Equilibria in the Magnesium Base Sulfite Acid System,** by S. T. Han and R. B. Kesler of the Institute of Paper Chemistry.

Performance Report on Vac-Sink Process

Early this year Union Bag-Camp started the first commercial plant for producing clean pine chips from mixed bark and chips produced from sawmill slabs. This utilizes the Vac-Sink process as developed by Battelle Memorial Institute under sponsorship of a group of pulp and paper manufacturers.

The basic process has been published in the May 15, 1961, issue of PAPER TRADE JOURNAL. Richard R. Chase, of Union Bag-Camp, described its performance and presented certain operating data. In the Vac-Sink process the mixture of chips and bark are subjected to sudden vacuum in a tank of water. The chips become water logged and sink. The bark floats because of its lower density. It has been found that a 9 minute cycle is sufficient to process a batch of chips—half of this time is used for filling the tank. Almost any reasonable vacuum will work, but 20 inches is normally used.

The installation has the capacity to process 115,000 units of chips annually. Bark fraction of the amount fed to the process is about 25 per cent. After separation the clean chips contain 2-3 per cent bark and 58 per cent water. Bark fraction could be reduced to ½-1 per cent by using a denser liquid with a specific gravity greater than that of water. (Union Bag-Camp does not consider this necessary since these chips are used in unbleached products.) Good wood lost with the separated bark has averaged 10 per cent of the input.

Chip quality has approached that of normal slab chips. Moisture content of both the slabs and resultant clean chips are critical. Too dry slabs lower the clean chip yield from the Vac-Sink system (green slabs are desirable). However, too high a chip moisture can pose problems in cooking and also increase evaporator loads.

Cost of the Vac-Sink equipment itself was $650,000. Total capital expenditure including auxiliary equipment (such as chip storage tanks, etc.) was $1.5 million. A ton of slabs delivered cost about $2.50 and UB-C realizes a ton of clean chips from 3.0-3.1 tons of slabs. UB-C expects to amortize the installation in 5-6 years. Additional benefits gained from the new process are savings in wood cost; possible reduction of woodyard inventory; reduced use of woodroom; possibility of utilizing other wood supplies (i.e., thinnings). One possible deterrent to wider use of the Vac-Sink process in the South (the process is at present economical Southern Pine and in areas where there is a large number of small sawmills) is the fact that in some areas many small sawmills are becoming part of large complexes which can afford the installation of whole log debarkers before sawing. This would obviate the use of a Vac-Sink system.

New Look at Old Pulping Modifications

Presenting the final report on Project CA845—New Developments in Alkaline Pulping—Edward F. Thode, of the Institute of Paper Chemistry said, "nonconventional means of full chemical pulping are chiefly modifications of the basic kraft process. Among those seriously explored on a laboratory scale in recent years are modifications employing sodium borohydride, sodium polysulphide, and sodium sulphite respectively. In addition, a hydrotropic process involving use of sodium xylene sulphonate has been recurrently advocated and re-explored on a laboratory basis (referring to recent news items on the McKee process).

The borohydride and polysulphide modifications, according to the available evidence, do seem to produce higher yields at a given level of delignification, but have no apparent favorable effect on strength properties. The alkaline sulphite process produces a remarkable increase (over kraft) in both tear and tensile but at quite poor yield levels. Published strength data on hydrotropic process pulps are unexciting (plus the fact there is not a proven recovery process).

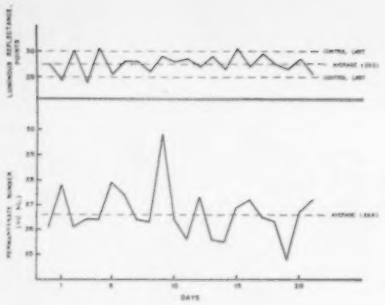
All of these pulping processes would be plagued with recovery and corrosion problems on a mill scale. To this are added the high cost of borohydride and the yield difficulties of alkaline sulphite. It is concluded that the future importance of these processes lies not in direct commercial exploitation of any one but in the usefulness of insights gained from experimenting with these. From such experimentation may well come the basic principles on which a new alkaline pulping process will be built—a process affording high yields of high strength fiber. The report was co-authored by H. G. Crandall of Mosinee Paper Mills, and N. S. Thompson, of the Institute of Paper Chemistry.

New Mill Control Methods

Control of Color in the Pulp Mill, Julian W. Daniel, Union Bag-Camp Paper Corp.

Because of the need for monitoring color of unbleached paper and paperboard, Union Bag-Camp has developed appropriate color control practices for the use of both pulp mill and paper mill. Since apparent luminous reflectance is basically a better index for rating the reflectance of impure color shades than is brightness, luminous reflectance was chosen as the basis for the control program. The color control efforts led to the modification of a commercial reflectance meter to make it suitable for mill control of luminous reflectance. Standardization practices for the modified instrument were developed. Correlations between luminous reflectance and yield of kraft pine and hardwood pulp were prepared to test the soundness of using luminous reflectance as a guide for pulping.

The correlations appear to be about as good as those which can be developed for permanganate number and yield. The relation between luminous reflectance and yield is sensitive to cooking changes, as are other empirical pulp yield relationships. A three-week period is shown in the following figure for which luminous reflectance of a pulp grade was controlled within ± 0.6 unit of the average (29.5) whereas permanganate number varied over a range of five units. It is the author's opinion that for a particular end use for unbleached kraft pulp, *other than bleaching,* variation of average permanganate number has little effect on end product quality. Variation would rarely be sudden, so machine operation would not be strongly af-



During a three-week period, luminous reflectance varied over a range of two units, while permanganate number varied over a range of five units.

fected by normal day to day or hour to hour change in pulp quality.

The color control program has three check points; pulp in digester room, pulp leaving the decker, and finished product. These control measures have been in effect at Union Bag for three years and have been used in connection with manufacture of a variety of unbleached papers and linerboards. Pulps that have been controlled by color are in the total yield range of 45 to 49 per cent, but this is not considered a limitation on this approach to pulping control.

Luminous reflectance is also determined on every reel of linerboard and on many grades of paper. A few grades actually carry a rejection based on color, many have listed desired averages, and still others are examined for color simply as an index of change in the product. Little can be done in the paper mill to control paper color because for a given grade color is almost completely dependent upon the character of the pulp delivered to the machine. The papermakers do exercise some control over linerboard color by adjusting the per cent kraft hardwood and may even change types of pine blend stock to maintain color.

Rapid Determination of Sulphide, Mercaptins and Hydroxide in Black Liquors, by R. F. Cashen and H. D. Bauman, P. H. Glatfelter Co.

A potentiametric method for the determination of sulphide, mercaptans, and hydroxide in black liquors utilizes a vacuum tube circuit employing a "magic eye" or tuning control tube for detecting the sharp potential inflection which occurs at the equivalence point. Detailed data and a movie were given showing the high precision of the method. Time required for the entire determination is less than 15 minutes, compared to the much longer times required in the standard titrimetric, and acidimetric methods. Mr. Cashen indicated, that although the new method has been used only by the research department, it can be used in the mill for routine production control.

Practical Aspects of Acid Cleaning of Evaporators

Evaporators operating on a 50-50 mixture of spent neutral sulphite semi-chemical and kraft liquors scale badly and acid cleaning is needed frequently to remove the calcium carbonate binder from the fibrous materials also present in the scale. T. T. Collins, Jr., Packaging Corp. of America discussed this problem.

The sextuple effect evaporators installed at Filer City consist of a 1A forced circulation body preceded by effects 1B,C on steam and effects 2-6 on vapor. The liquor feed is split between effects 4 and 5. The original installation consisted of welded seam type 304 stainless tubes in units 1A down through 2 while the rest of the tubes were of carbon steel.

The rapid deterioration of Type 304 stainless steel tubes while cleaning with inhibited hydrochloric acid resulted in initiation of a study of the substitution of phosphoric and/or sulfamic acids together with a suitable inhibitor.

It was found that when carbon steel is used in the equipment, sufficiently inhibitor must be used with phosphoric or sulfamic acids. For equipment that is 100 per cent type 304 stainless the use of phosphoric or sulfamic acid without inhibitors for our mild cleanings appears to result in very little, if any corrosion. Inhibitors should be tested to make sure they are effective. One inhibitor, a film-forming amine, stood out best in every catagory. There were some inhibitors studied that had an adverse effect when used with sulfamic acid and caused it to attack severely both steels. No cases of this appeared when the same inhibitors were used with phosphoric acid.

Mill Procedure

The procedure adopted at Filer City is as follows, using sulfamic acid and the amine inhibitor: at the end of a water boil of the evaporators for about two hours, the water from the 1A effect is recirculated back to the 4th effect. Sulfamic acid with inhibitor is introduced into the suction of the transfer pump between the 4th to the 3rd effect. This process requires about an hour and the acid is circulated at 150-170°F for about two hours. Adding sulfamic acid to give an initial concentration of about 3 per cent results in a one per cent concentration after the two hour reaction period. Sufficient inhibitor is added along with the acid to make its concentration 0.2 per cent on the total concentration. When it appears that the evaporators require extra acid to finish up with this minimum residual, it is added without any extra inhibitor. At the end of acidizing, effects 1A through 4, the residual acid is then pumped through effects 5 and 6 before the units are finally washed out with water. For the complete acid cleaning, the evaporators are off-line for 8-10 hours. For the first year, the cost of cleaning with sulfamic acid was about $40,000.

A modification of this above has been to substitute phosphoric acid for the first 75 per cent of the sulfamic acid. Sufficient inhibitor is added to result in 0.1 per cent concentration of the liquid content. The more active sulfamic acid is then added without inhibitor. A reason for use of phosphoric acid to the greater extent is that it is less expensive and could result in a savings of about 40 per cent of the cost of cleaning with sulfamic acid alone.

Another procedure has been to save the spent acid from a cleaning in a tank and start the next cleaning with it by flushing it through the evaporators to the server. Beyond this, there does not appear to be any safe way to further decrease the cost of cleaning. Certainly no attempt at cost cutting should be made by reducing inhibitor concentration below an adequate minimum.

Commentary

In a prepared commentary of Mr. Collins' paper, W. P. Cooke of DuPont pointed out that chlorides are very active in penetrating the oxide film which protects stainless steel. "Where there is no oxygen to restore this film, such as would be true under the mat of fibers which builds up on evaporator tube surfaces, corrosion resistance is reduced and pitting can develop. Black liquor can contain significant concentrations of chloride, but the pH of this liquor or a mixture with NSSC liquor is 10 or above, and

experience has been that pitting takes place below pH 8. Once started, pits are likely to continue developing at an accelerated rate. The foregoing information may explain the fact that pitting was experienced not only in the weld metal but also in the base metal in the case cited by Mr. Collins.

"The threat of tube failures may not be the only reason for using some other acid in place of inhibited hydrochloric. The International Paper Company's Springhill, La. mill reports no evidence of corrosion on their stainless steel tubing after upwards of 20 cleanings with inhibited sulfamic acid over a six year period. Prior to switching to sulfamic from their previous use of inhibited hydrochloric, they observed that even though they experienced no tube failures, each acid cleaning would etch the tube surfaces enough to hasten the rate at which the tubes would scale up again in subsequent service. After switching to sulfamic, they observed that tubes stayed cleaner longer, presumably due to absence of the etching effect.

"There is no question but that inhibited phosphoric acid can be safely used on welded stainless steel tubing without any selective attack on weld metal, etc. It is less expensive on a hydrogen ion basis than sulfamic acid. However, as suggested by experience at the Filer City Mill, it is slower acting on scale than sulfamic. Since time is a costly commodity in most pulp mills, it might thus be argued that the effective use-cost of sulfamic will be somewhat lower than that of phosphoric, all things considered," he concluded.

T. T. Collins, PCA, technical program chairman; and W. P. Cooke, Du Pont.

Mill Experiences in Hot Stock Screening

The nine man panel on black stock screening presented a wealth of data in information. Some general points brought out during the session are listed below:

It is to be noted that while it is referred to as black stock screening, it is to denote hot stock screening of kraft pulps at some point between the blow tank and brown stock washers.

Members of the panel were: R. W. Stoertz, West Virginia Pulp & Paper; M. J. Dunford, Continental Can; A. L. Conner, Rome Kraft; A. H. Wickett, Weyerhaeuser; E. E. Archibald, Georgia-Pacific; R. G. Hall, Union Bag-Camp; D. F. Lehman, Black Clawson; and S. Fahlgren, Bird Machine. Panel moderator was R. R. Fuller, of Gulf States Paper.

• Looking at the overall process, the effluent problem is growing in importance. Conventional screen rooms have effluent volume of from 1 to 4 m.g.d. and are a large source of oxygen demand. Elimination of the conventional screen room should effect a marked reduction in the effluent problem.

• Pre-screening should effect a reduction in fiber loss through elimination of large volumes and also the spillages of the conventional screen room.

• Where pre-refining is also included, the elimination of the troublesome knot and reject problem can be hoped for. If the cooking can be less complete, there is the probability of increasing the yield to effect a reduction in wood usage.

• Pressure screens should be preceded by refiners, fibrilizers, knottors, etc. as a precautionary measure, to permit the screens to operate more efficiently and with less maintenance.

Washing Capacity Affected

• Hot stock screening and refining has affected capacity of washers—averaging 10 per cent. In hot stock refining, it is affected much more than just in screening. Reduction in freeness also produces a denser cake on the washer, thus impairing drainage and increasing salt cake consumption.

• How much will be rejected varies with the condition of the pulp and the desired cleanliness. If one is after only particle separation a reject rate of 5 per cent of the inlet flow is possible. If, however, one is after the maximum optimum cleaning possible, a reject rate of 25 per cent of the inlet flow may be necessary. Reject rate and hole size are the two most important factors in the cleaning efficiency of a screen. The two must be considered together to give the maximum efficiency of an installation. It may be more economical and efficient to use one screen with .079" diameter holes and a 25 per cent reject rate than two screens with .062" diameter holes and a 15 per cent reject rate.

• Rejects are controlled directly in a pressure screen. This can be by manual or automatic means. In either case the controls are pre-set to permit rejection at a fixed rate. With automatic controls purging would be accomplished either on a fixed time cycle or as required to compensate for anything tending to cause plugging in the screen.

Breaker Trap Salvages Fiber

• The breaker trap does not drastically affect cleaning and yet will salvage some good fiber from the larger fiber bundles and uncooked chips and level out the larger pieces for better handling downstream. The breaker trap requires approximately 1 h. p. t. d. or less in this application.

• Where disk refiners have been used following breaker traps experience has shown that they are limited to a range of 1 to 2 h. p. t. d. because of the combination of contamination and freeness drop.

• One other piece of equipment which is being used in the pre-screening area is the liquid cyclone. This centrifugal cleaner can be used directly after the blow tank to trap metal and metal contaminated knots, or to remove sand, grit and other small particles immediately preceding the screens.

• Our experience to date has shown that there is no real difference in the actual screening operation as performed in hot liquor or water.

• The major operating hazard in hot stock screening is the formation of a stable foam which prevents continued operation of washers and rejects handling systems.

• On the heavier grades of liner-

board the appearance of the sheet is comparable to that made from conventional screened washed stock. However, on the lighter weights there is a marked increase in the amount of "chop" that shows up on the liner side of the sheet.

• Screening ahead of the washers without refining gives a stock cleaner in the sense of less rejects than conventional screening. The soda content off the washers is lower with pre-screening, and with prerefining and screening. Soda content of the stock from the three stage vacuum washer without prescreening runs from 30 to 45 pounds as sodium sulphate averaging probably 40 pounds. With pre-screening it runs 18 to 28 pounds.

• The quantity of shives in the accepted stock and the amount of good fiber in the rejects fraction are considered two criteria of screening efficiency. Pulp screens can be operated **either** to produce a minimum amount of good fibers in the reject fraction **or** they can be operated to produce the maximum cleanliness of accepted stock.

• Knotters are needed to prevent unusually large chips from jamming screen inlets; however, adequate chip screening in the wood room may possibly eliminate this need. Washer operation following hot stock screens is more efficient than with as-blown pulps, as would be expected when the liquor bearing knots and shives have been eliminated. However, this advantage is more than offset by the loss of the additional washing stage associated with conventional screening and thickening.

• If a knotter screen is used, it is preferable to use a pressure screen to avoid the introduction of air. A pressure screen also permits flexibility of location and does not require a separate pump. Rejects from the knotter screen may have to be fed back to the digesters for re-cooking in a one-stock mill but can be diverted to a lower grade system in a multi-grade mill.

• If some refining can be tolerated or is required in the higher yield system it should utilize as little horsepower as possible. Refining in this area is necessarily limited to prevent lowering freeness too much which will affect washer operation. This will be dictated by the degree of cooking and the type of wood.

• Using unscreened chips produces a small quantity of large knots that do not defiber properly in the mechanical system tending to give fiber bundles in the finished stock. These bundles are small enough to pass a flat screen but still can be distinguished from normal fibers. It appears coarse crushing or screening out the over 1-inch fraction followed by crushing of the oversize night reduce this.

To summarize, some of the benefits to be gained through the application of hot stock screening are listed in the following (not necessarily in any order of importance):

Improved washing with a consequent saving in salt cake loss.

Savings in manpower.

Elimination of foam problems with consequent saving in money spent for foam killers.

Reduction in maintenance.

Higher capacity per screen resulting in fewer screens and consequent saving in equipment cost.

Reduction in power consumption per ton of pulp.

A possible reduction in chlorine consumption in those mills making bleached grades (due to improved screening and washing resulting in less material in the accepted stock which would consume bleach).

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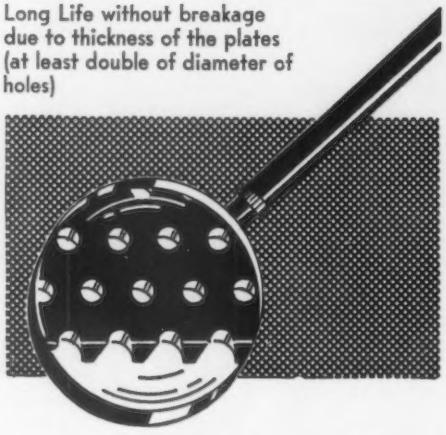

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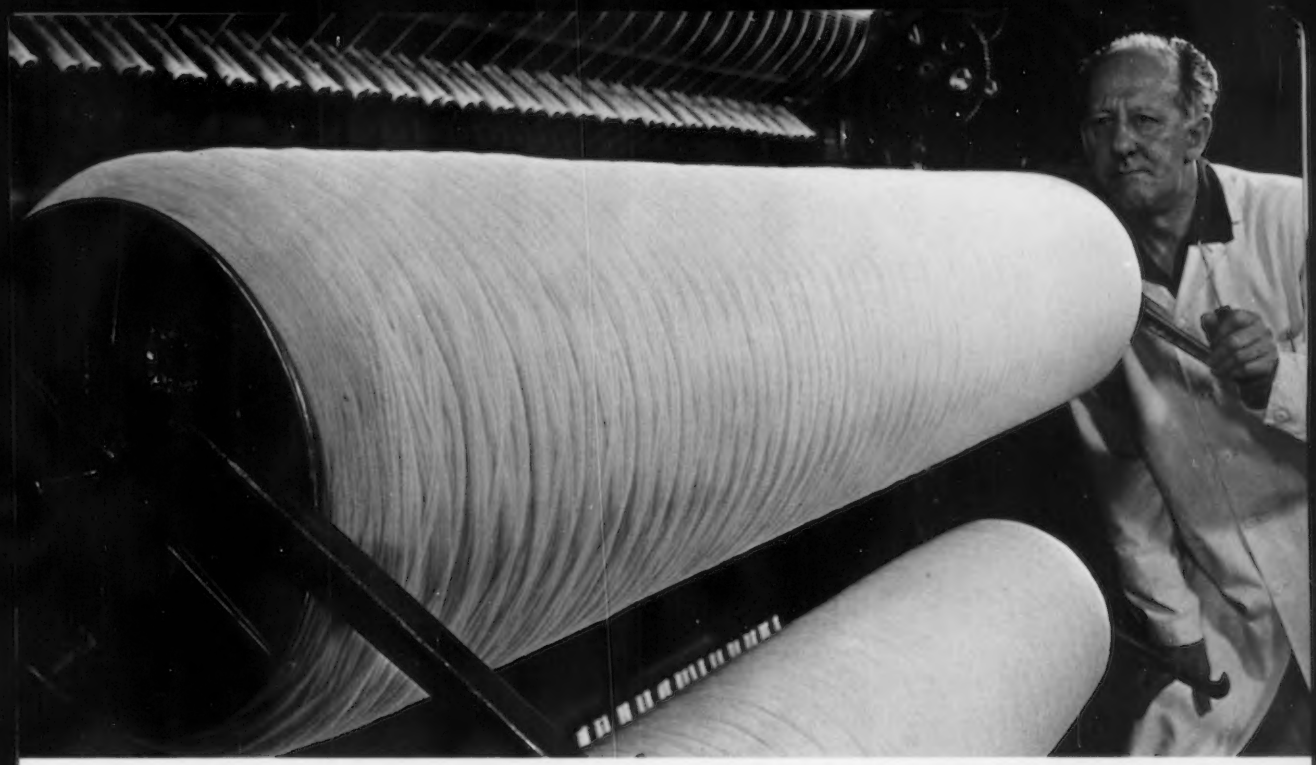

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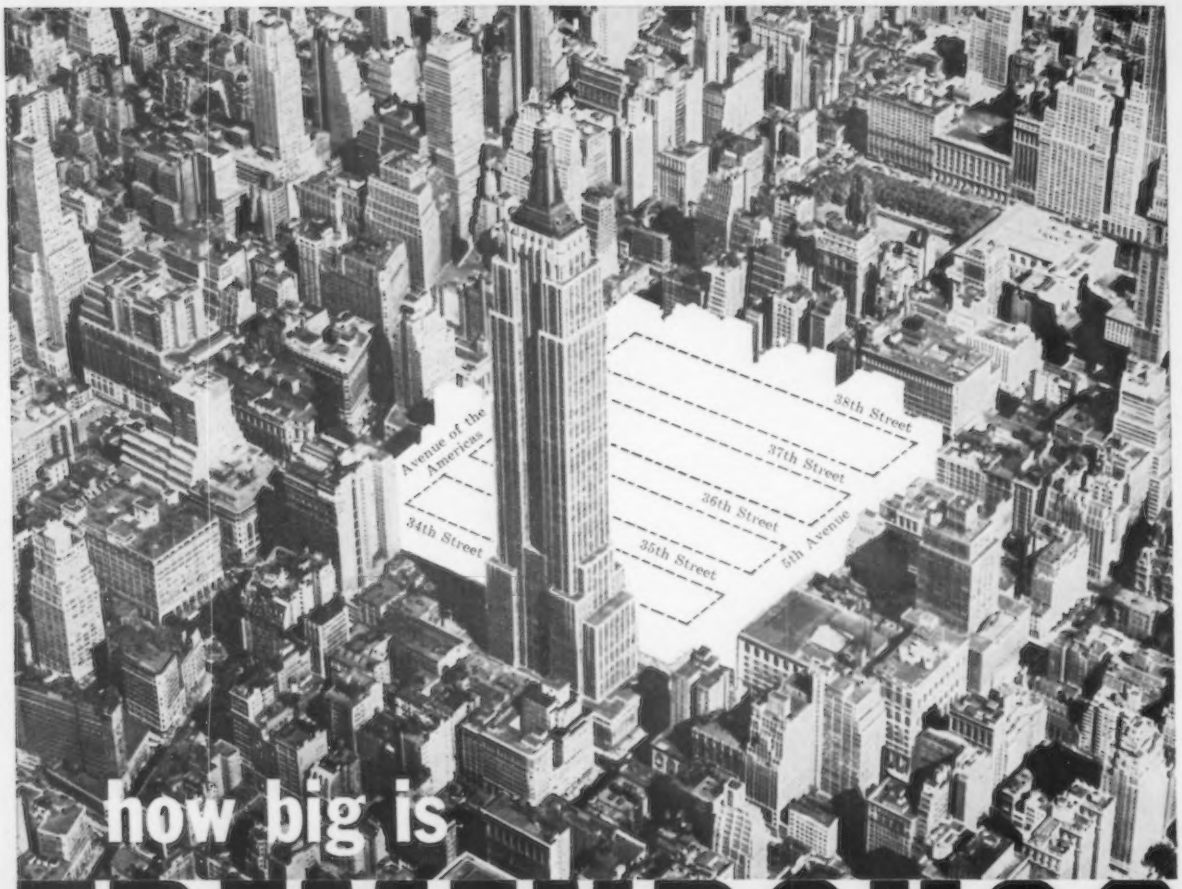

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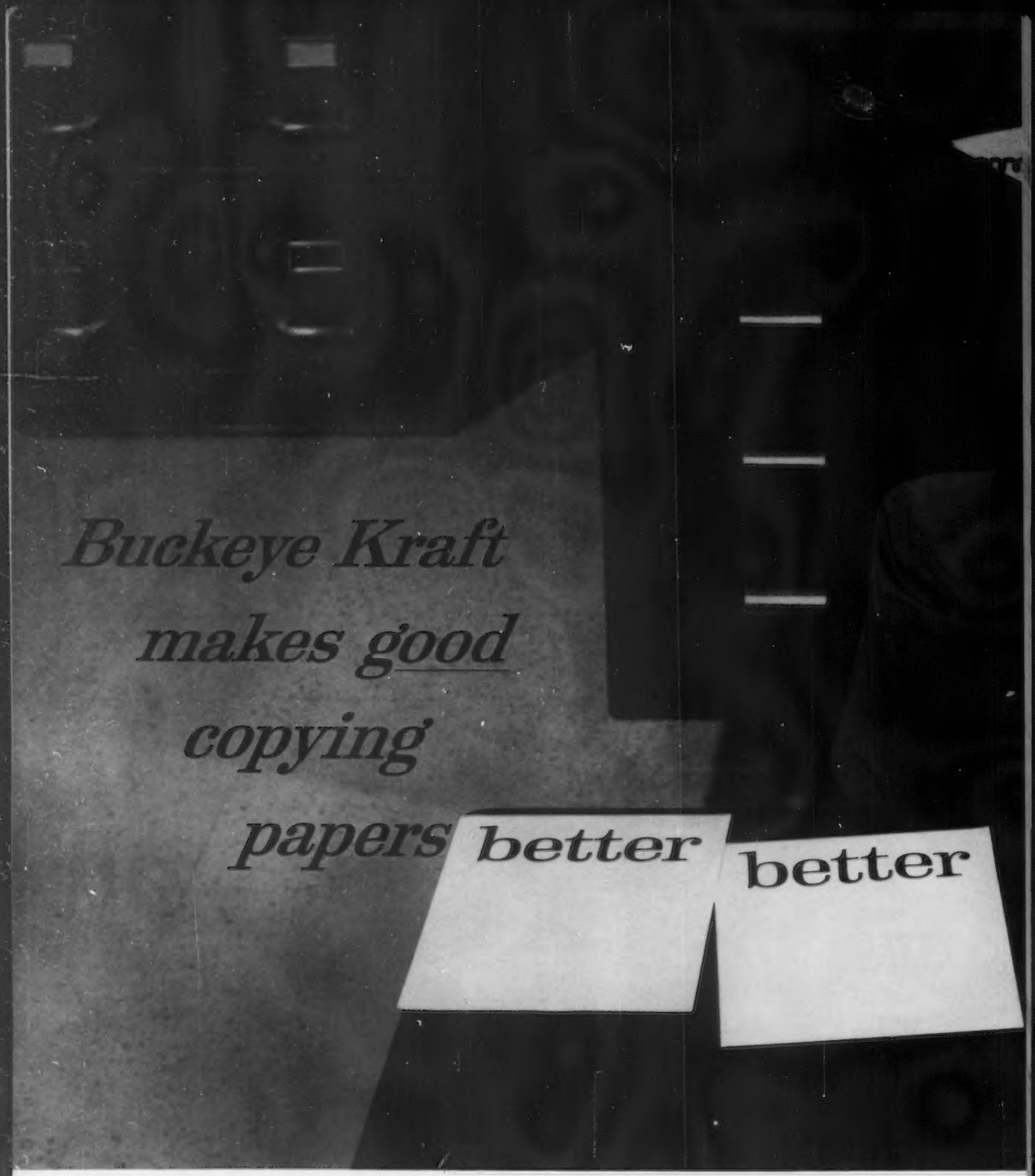

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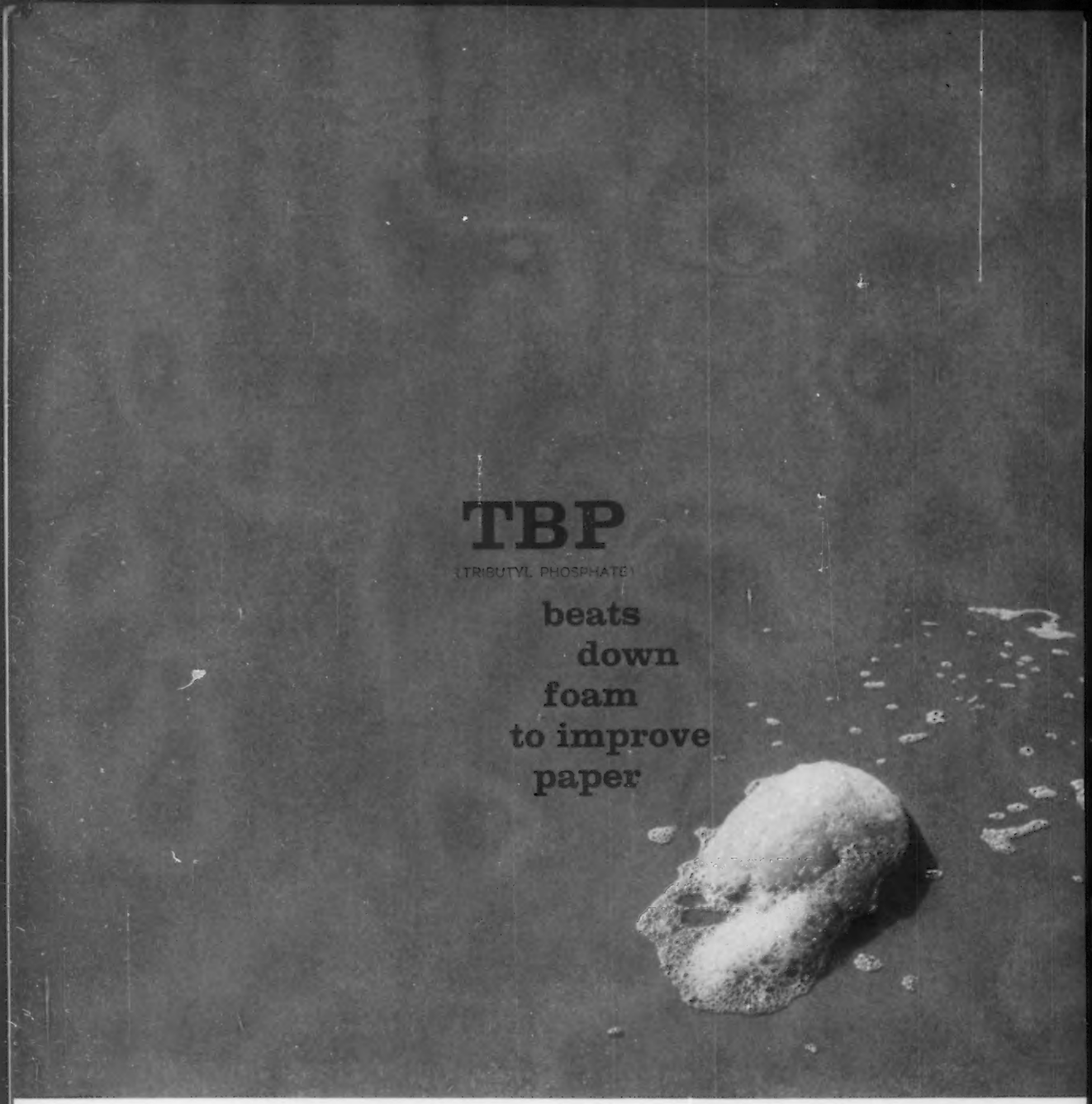

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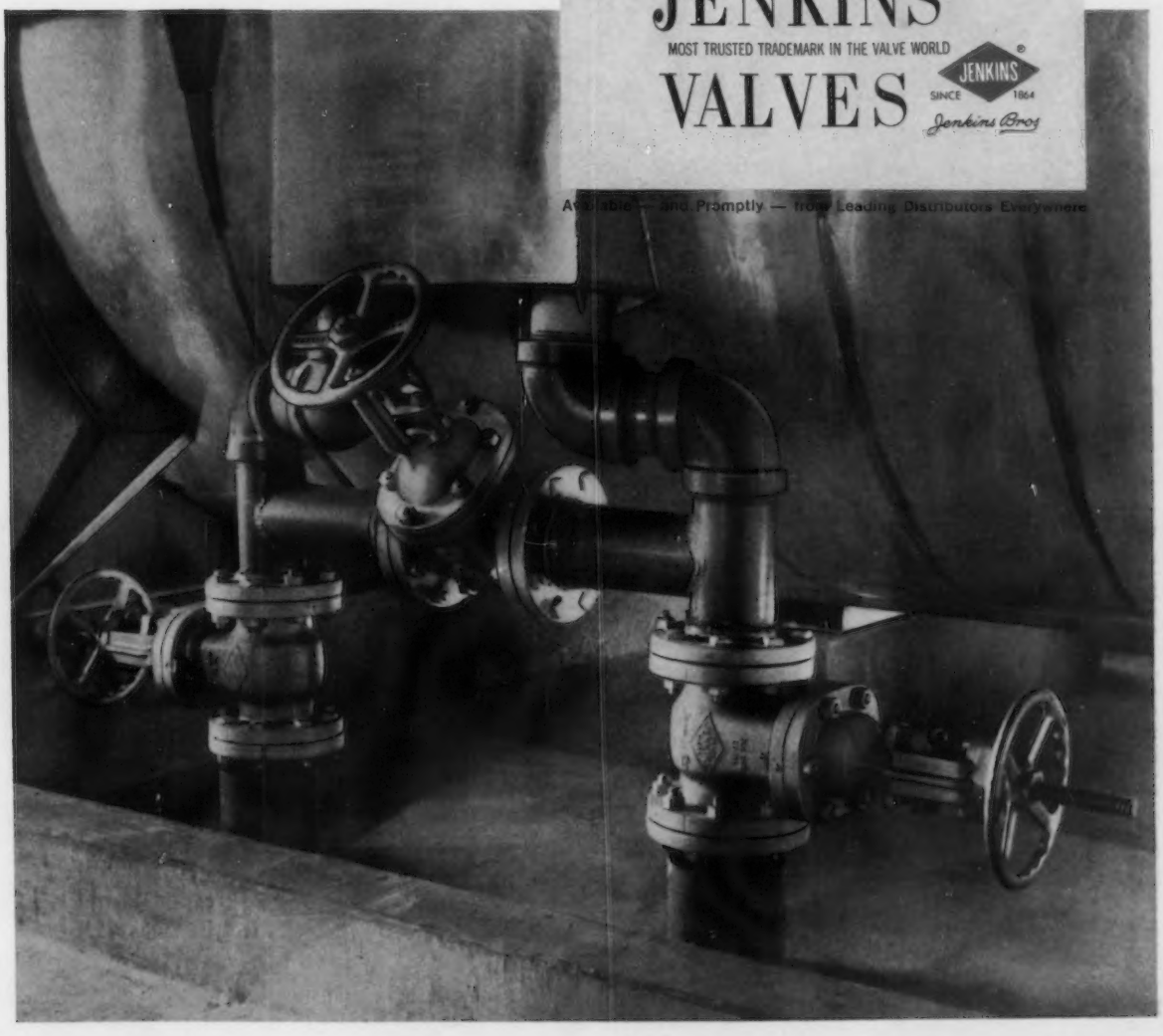

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Contains a cross-sectional view of construction of the filters. Maximum rated capacities are tabulated for each of the different size units from 3,720 g.f.m. to 130,500 g.p.m. operated at a face velocity of 450 f.p.m. Data Sheet, Air-Maze Div. of Rockwell-Standard Corp., 2500 Miles Road, Cleveland 28, Ohio.

Centrifugal Screens

Describes the operation of both the new and improved "K" and the "KX" Cowan centrifugal screens. Contains sectional elevations, exploded views and drawings giving their general dimensions. Also included are charts listing information required when ordering, recommended motor speeds and a suggested spare parts stock. In addition, there are installation notes, maintenance instructions, a description of construction details and performance curves. Bulletin C105. 20pp. S. W. Hooper Corp., P.O. Box 129, Delmar, N. Y.

Eco Gearchem Pumps

Describes Series 900 heavy-duty Gearchem pumps for flow rates to 30 g. p. m., pressure to 100 p. s. i. These pumps feature stainless steel housings and shafts, metallic or plastic gears, conventionally packed stuffing boxes or mechanical seals; are self-priming and will handle liquids at temperatures to 400°F. with viscosities to 50,000 SSU. Bulletin GC1261, 2 pp. Eco Engineering Co., 12 New York Ave., Newark, 1, N. J.

Guide to Bulk Starch Automation

Outlines a plan to help manufacturers convert their operations from bag handling to bulk handling of starch. Describes different systems, discusses their utility, and defines the engineering help offered. Penick & Ford, 750 3rd Ave., New York 17, N. Y.

Small Steel Gate Valves

Describes new engineering features and performance characteristics of Lunkenheimers newest valves which have screwed or socket ends. The valves are available in a bolted bonnet design in 1½ inch and 2-inch sizes, and in a union bonnet in sizes ¼ through 1 inch. Circular No. 637. Lunkenheimer Co., Box 360, Cincinnati 14, Ohio.

Goetze Metallic Gaskets

Describes "where, how, and why they work." Published as a service to gasket users, the booklet is fully illustrated with photographs and cross-sections, augmented by concise, descriptive copy. PK-152A, Johns-Manville, Packing & Friction Materials Div., 22 East 40th St., New York 16, N. Y.

Taylor Fibre Condensed Catalog

Gives selection and application information for laminated plastics and vulcanized fiber. Engineering data useful in applying these materials in electrical, electronic and mechanical applications are also given. 8 pp. catalog. Taylor Fibre Co., Norristown, Pa.

Sludge-Blanket Clarifier

Describes the Type M Precipitator, a sludge-blanket clarifier whose agitator arms are driven by water jets at the tips. Operation and design are described fully in illustrations and text. Fifteen models ranging from approximately 150 to 7,000 g.p.m. in capacity are listed. Type M Folder, 6 pp. Permutit, 53 West 43rd St., New York 36, N. Y.

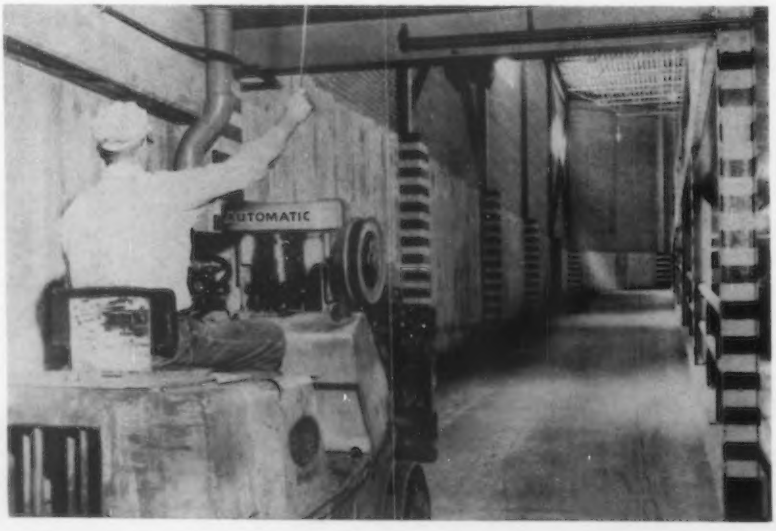
Pretreatment for Cooling Water Systems

Tells when, where and how to use. Contains technical data sheets on specific products, and reprints which document the history and theory of the Nal preps. Data File C4, Nalco Chemical Co., 6200 West 66th Place, Chicago 38, Ill.

Lift Truck Traffic Controlled by Stop Lights at Blind Corner

Six hundred trips a day make a real super highway out of a ramp in the Bleached Board Division of West Virginia Pulp and Paper Co., Covington, Virginia. The company produces kraft paper and paperboard in the manufacturing area of its plant and stores paper rolls in the basement. Automatic lift trucks move the rolls down the 6 per cent ramp to storage. Since the ramp has a blind corner, a system of traffic lights has been set up to prevent more than one truck from using the ramp at the same time.

As a truck approaches the ramp, the driver checks a traffic light and proceeds if it is green. Upon entering the ramp, he pulls a conveniently placed cord which changes the light to red at both the top and bottom of the ramp. As he leaves, the driver re-sets the light for the next driver. This traffic system has allowed West Virginia to use their lift trucks safely with maximum efficiency.



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What a world of difference Avisco® rayon makes in specialty papers

Rayon fibers work wonders in specialty papers. For these reasons:

Avisco rayon is immaculately clean, white and absorbent. American Viscose offers a wide range of micron diameters and fiber lengths to control, respectively, porosity and tear strength. Bright fibers add luster; dull fibers lend opacity.

The saturating paper people use rayon in their surface sheets for better transparency, cleanliness and freedom from contamination. Food packagers choose Avisco rayon because it is clean and taste-free. Makers of filtration papers welcome the precision porosity possible through close control of micron diameters.

Whatever your product problem, AVC research and development services are ready to help. Write today.

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American Viscose Corporation
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Company_____

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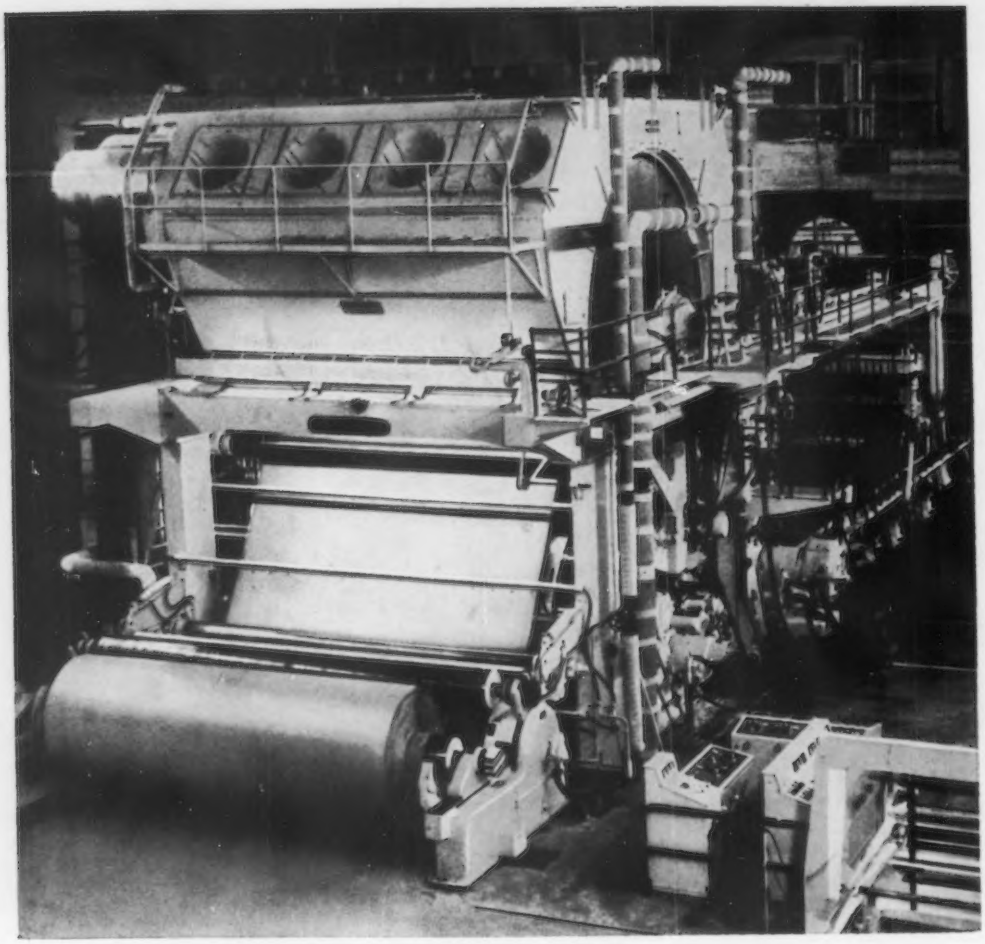
AMERICAN VISCOSE CORPORATION, 350 Fifth Avenue, New York 1, N. Y.



the largest Yankee machine in the world

This machine has a wire width of 212" and incorporates an M.G. cylinder of 16.5 ft. dia. for a steam pressure of 4.5 atmospheres. M.G. Kraft and spinning papers are produced at working speeds up to 1000 ft/min.

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Agents: Bulkley, Dunton Pulp Company, Inc. 295, Madison Avenue, New York 17 N.Y./USA

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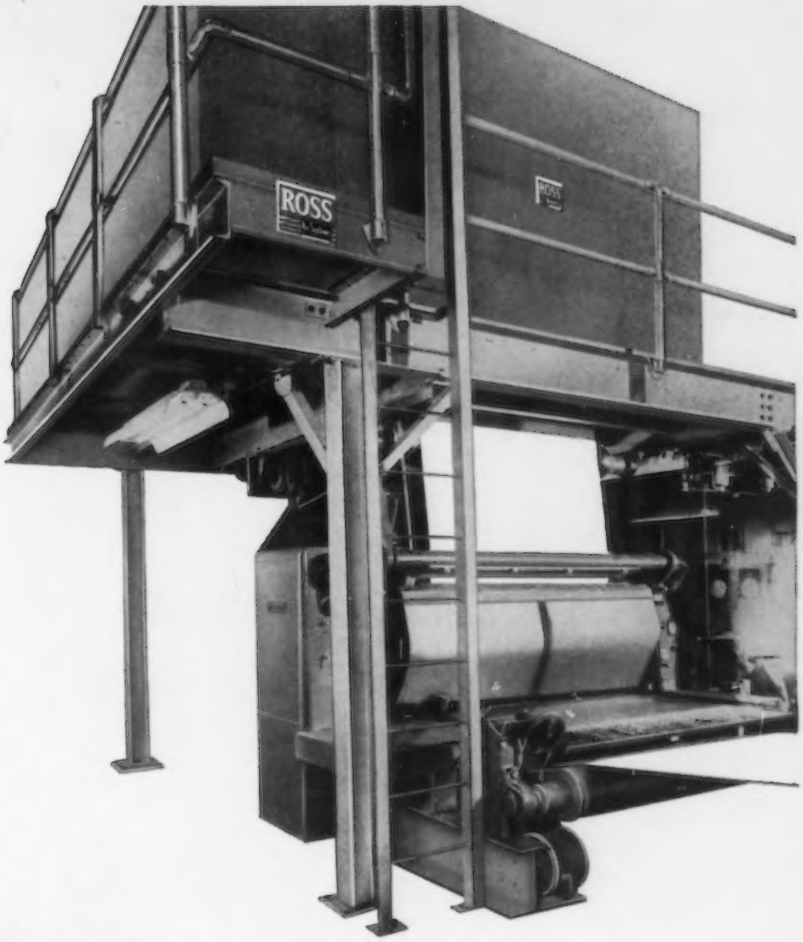

FIRST

in COMPLETE COATING LINE KNOW-HOW and EQUIPMENT for processing continuous web materials including Paper • Foil • Fabric • Board

Here at Rockford Paper Mills Inc., Rockford, Mich., the Waldron Microjet Coater and Ross Dryer provide the complete, integrated coated paper line from a single source... ROSS/WALDRON.

Your FIRST SOURCE for complete lines of versatile equipment engineered for both today's and tomorrow's production demands ...manufactured to the highest standards and guaranteed to give you a better quality product at a higher production rate with top printability.

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ROSS/WALDRON

Technical competence in complete machine lines

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P. O. Box 791, New Brunswick, New Jersey

PJT NEWS OF CONVERTERS

Westab to Purchase Montag for Cash

Western Tablet and Stationery Corp. of Dayton, Ohio, has made arrangements with Champion Papers, Inc., of Hamilton, Ohio, and Montag, Inc., of Atlanta, Ga., for Westab to purchase for cash the business of Montag on January 1, 1962, according to a joint announcement.

Westab, whose executive offices are located in Dayton, Ohio, has plants in St. Joseph, Mo.; Kalamazoo, Mich.; Huntington, Pa.; Richmond, Va.; Holyoke, Mass.; Salem, Ore.; Chicago, Ill.; and in Garden Grove, Sunnydale and San Jose, Calif. Montag has plants located in Atlanta, Ga., and Terrell, Tex.

KVP Sutherland Sells Albany, Ga., Plant

KVP Sutherland Paper Co. has completed arrangements for the sale of its Albany, Ga., converting plant to Brunswick Corp.

At the time of the merger of The KVP Co. and the Sutherland Paper Co. in January of last year, both companies operated plants in Georgia. One plant was located in Griffin, the other in Albany. These plants had been established to better serve customers in the southeastern United States. In this respect they had a similar purpose.

The decision to sell the Albany plant was made on the basis of many studies and comparisons. These included the locations of our customers' plants in that area, warehousing costs, and shipping charges.

Southern Envelope Opens Branch Plant

The Southern Envelope Manufactures, Inc., of Nashville, Tenn., has announced the opening of a new branch plant in Charlotte, N. C., to manufacture under the name of Atlantic Envelope Co. of Carolina.

Sigmund Held, president of the 10-year-old Nashville firm, said Southern is part of the South's largest envelope organization, founded in Atlanta in 1893 by his grandfather, Sigmund Guthman. Other plants are at Atlanta, Miami and Tampa.

Fibre Box Ass'n. Elects Directors

The Fibre Box Ass'n has elected L. P. Jones, B. E. Roberts and Paul A. Schilling directors.

Mr. Jones is vice president, national accounts, for the River Raisin Paper Co. Division of Union Bag-Camp Paper Corp., Monroe, Mich.

Mr. Roberts is district sales manager at Inland Container Corp.'s plant in Macon, Ga. Joining Inland in 1932, he has had nearly 30 years' experience in the corrugated fiber board industry.

Mr. Schilling is president, Waldorf Paper Products Co., St. Paul, Minn. A graduate of the University of Minnesota, Mr. Schilling started with Waldorf in 1913, and after time out for service in World War I, was appointed office manager in 1921. In 1928, he became secretary, general manager the following year, and president and treasurer of Waldorf in 1932.

Weyerhaeuser Moves Horn To Olympic, Wash., Plant

William J. Horn, resident manager of Weyerhaeuser Co.'s shipping container plant in Honolulu, has been appointed resident manager of the firm's Olympia, Wash., plant.

Mr. Horn will be replaced at Honolulu on December 1 by Theodore J. Sack, who has been serving as plant manager of the Alameda, Calif., shipping container unit.

Georgia-Pacific Names Supt. for Toledo Plant

Hubert Spencer will be the superintendent of Georgia-Pacific's new paper bag plant which is now under construction at Toledo, Ore. He will be on the job during the building of the plant.

Mr. Spencer spent the past two years with Fortifiber Corp., and 12 years with the flexible package division of Continental Can Co., both of Los Angeles.

R. A. Brooks

Con Can Names District Sales Manager for Boston

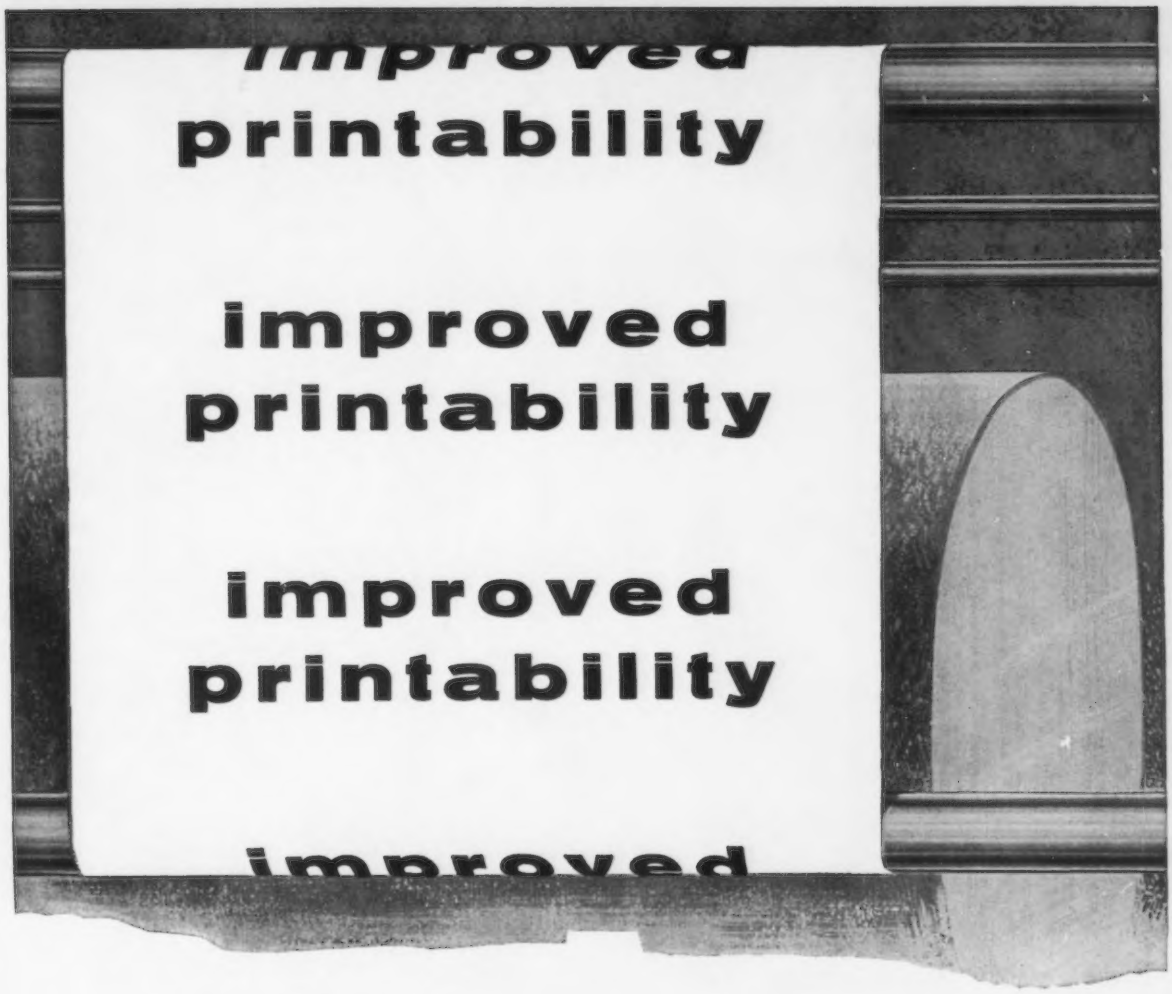
R. A. Brooks has been named district sales manager in Boston for the Folding Carton and Drum Division of Continental Can Co. Mr. Brooks was previously a salesman in this office.

American Can Appoints Milk Container R&D Mgr.

Delmont J. Lohuis, who has been with American Can Co. for 26 years, has been appointed research and development manager for the company's Milk Container Division.

Mr. Lohuis' most recent position was assistant to the corporate vice president in charge of research. In the last 10 years, he has specialized in research on problems involving paper and plastics. He is a graduate of Carroll College in Waukesha, Wisc., and received a master's degree from the University of Wisconsin, at Madison.

The Milk Container Division manufactures and sells the familiar line of flat-top containers with expanded plug opening and dispensing feature for milk and fruit juices. The division has also recently introduced a new outside polyethylene coated, inside polymer lined "five-barrier" container in the quart size, and a laminated polyethylene coated inside and outside half gallon container.



with Gelva C-3 and C-5 copolymer resins

When used as a surface size, GELVA C-3 and C-5 polyvinyl acetate copolymer resins impart a smooth finish to paper. Ink receptivity is improved. Contrast is sharply defined. When deposited from ammoniacal solution, the resin produces a water resistant film. Used in the size tub or size press, GELVA copolymer resins give improvements in wet and dry tensile and Mullen. The resins are alkali soluble. Broke recovery is quick and easy.

Write for full technical information on GELVA C-3 and C-5. Shawinigan Resins Corporation, Department 7-C, Springfield 1, Massachusetts.

SALES OFFICES: ATLANTA CHICAGO LOS ANGELES NEW YORK CLEVELAND SAN FRANCISCO GREENSBORO SPRINGFIELD ST. LOUIS

PROPERTIES

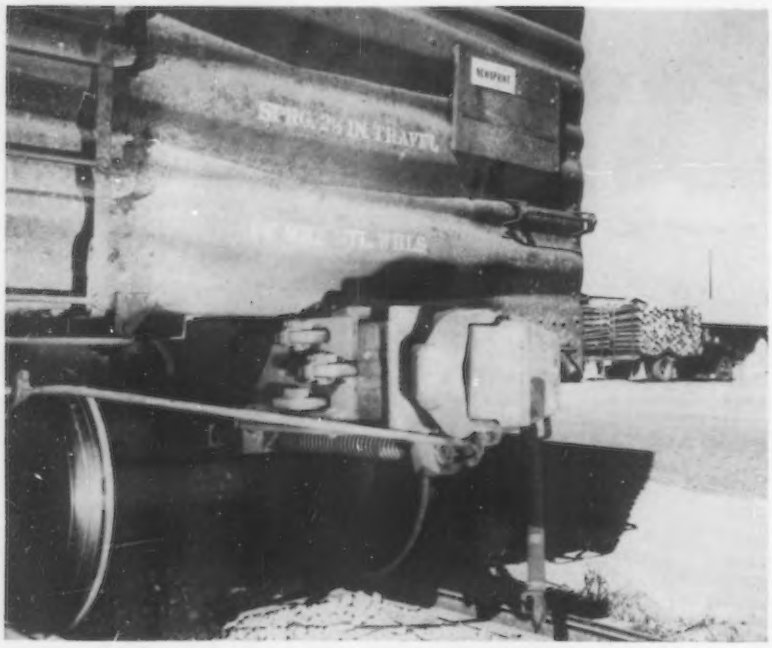
Form—Fine beads (0.2—1.0 mm. diameter)
Transparency—Excellent
Light Stability—Good
Storage Stability—Excellent

	Softening Point	Maximum Flowable Solution
C-5V-10	123°C	20%
C-3V-10	123°C	35%
C-5V-16	134°C	20%
C-3V-20	155°C	25%
C-3V-30	180°C	20%

Softening Point: Ball and Ring Method
Solution: Ammoniacal

GELVA® *polyvinyl acetate resins by* **SHAWINIGAN RESINS**

NEW EQUIPMENT & SUPPLIES



Newsprint Shipping Losses Cut 83 Per Cent by Cushioning

Loading damage for Southland Paper Mills, Inc., has nosedived since this large newsprint manufacturer started using freight cars equipped with a coupling cushioning device.

A hydraulic shock-absorbing coupler permanently attached to the freight cars helped to lessen the shock in the two adjoining cars. The device is manufactured by the Freightmaster Division of Halliburton Co., in Fort Worth, Tex. Before cushioning devices were installed, Southland had an average of three out-of-round and flattened rolls per car. Now, they average one flattened core every 2 carloads. This is an 83 per cent reduction in damage.

In Dallas, the production manager of *The Dallas* (Tex.) *Morning News*, Robert E. Harrison, says that use of the cushioning devices "has resulted in fewer web breaks while we are running our high-speed presses. Also, reduction of the out-of-round problem improves press room operations because we do not have to slow down due to 'whip' on a roll."

Direct Yellow Dyes For Fine Papers

A yellow paper dye, Direct Bond Yellow P-A, developed by Ciba Co., Inc., is of particular interest to mills seeking a good economical greenish yellow as a base for greens, canary shades or as a self color. Formulations based on Direct Bond Yellow P-A show substantial savings in many cases, says Ciba.

Direct Bond Yellow P-A is reported as having good to excellent light fastness, excellent alkali fastness, good water and acid fastness and good solubility. It is bleachable in chlorine and because of its good affinity for both fillers and fibers gives a non-two-sided sheet.

Direct Bond Yellow P-A is of particular interest to those mills producing bonds, writings, ledgers and other office grades. Its pH stability makes the dye eminently suitable for use on tissues, towelling and napkin stocks. Ciba Co., Inc., Fair Lawn, N. Y.

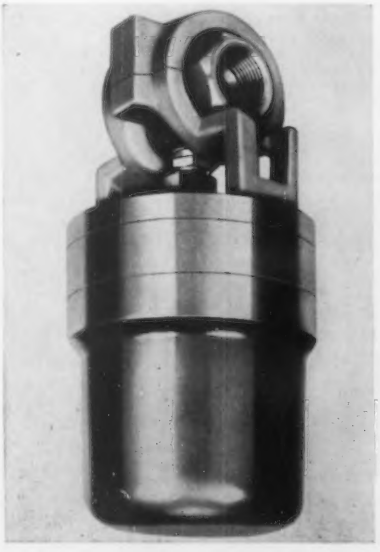
Ball Valves with Air and Electric Operators

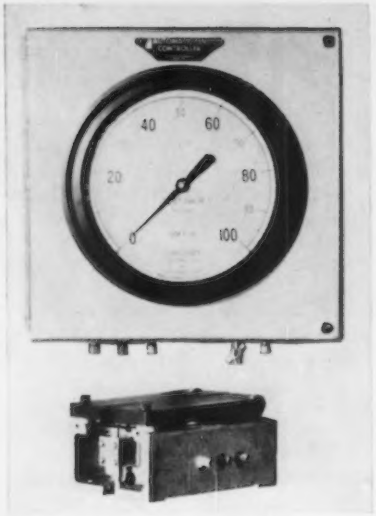
Hills-McCanna McCannaflo ball valves now are available with pneumatic and electric operators for automatic and remote on-off flow control applications. Both types of operators are sold integrally with the valve or separately for valves already in service.

Pneumatic operators are available in three sizes; valves from ¼ inch through 2 inches. All operators mount directly on the valve. Optional accessories include a solenoid valve for electrical control and a limit switch for on-off indication. A fail-safe device also is available to return the valve to either fully open or fully closed position should the air system fail.

Electric operators for McCannaflo valves are of weatherproof and explosion-proof construction and feature stainless steel output shaft, aluminum housing, and hardened steel gear train. Operators are clamp-mounted directly to the valve body. Cycle times as short as five seconds from full open to full close are possible, depending on valve size.

Power required for these valves is 115 volt a-c. Operators for other voltages in a-c or d-c also are available. McCannaflo ball valves are available in sizes from ¼ through 2 inches for pressures to 1000 psig, and temperatures to 550°F. Carbon steel, stainless, bronze, and aluminum valves are stocked as standard with Teflon, reinforced Teflon, Buna-N, neoprene, and secondary "Fire-Seal" seats. Complete information is available upon request to Hills-McCanna Co., 400 Maple Avenue, Carpentersville, Ill.





Tension Controllers Have Closed-Loop Systems

The Pneumatic Applications Co., Simsbury, Conn., has introduced a type of Tension Indicator for application wherever web tension is critical. They are available with either a 10-inch dial-type indicator or chart recorder. (12-inch recorder also available.)

The Tension Indicators are built around an all-pneumatic, closed-loop system of measurement. This, according to company engineers, provides a system of more consistent accuracy than open loop hydraulic or pneumatic systems.

Heart of the system is a transmitter connected to a load sensing journal through a bearing pillow block. Fluctuations in tension are transferred to a load bearing plate on the transmitter. The plate, pivotally mounted so one end is free to move within limit stops, transmits the motion through a load limiting force lever to the air relay valve. Maximum plate motion is .007 inch. By a combination of actions, the air relay valve varies the air pressure in the loop system accordingly to balance against the imposed load. This air pressure is applied as a linear signal to the indicator gage or recorder.

Measurement is a true average indication of tension loading forces. Accuracy is well within the commercial tolerances of the indicator gages and recorders. Except for the transmitter, all controlling units are contained in the indicator or recorder housing.

The Tension Indicators are available with four different physically-sized transmitters having top ranges

Why caustic and chlorine are Key Chemicals at Wyandotte

Big volume? Long experience? Both count, and we have both. But far more significant than our total chlorine-caustic tonnage is the purity of every ounce of every order we ship. It's the highest. You can count on it: it's guaranteed. And long experience has full value only if it is put to work for the customer . . . ours is. May we put our experience to work for you?

WYANDOTTE CHEMICALS

MICHIGAN ALKALI DIVISION, WYANDOTTE, MICHIGAN

of 100, 1100, 3000 and 6000 lbs. with each transmitter available in fractional portions of the maximum range for the specific size.

Design and Size Improvements Made in Mount Hope Rolls

Two sizes of fixed-bow ball bearing Mount Hope Rolls are being added to Mount Hope's line, it was announced by officials of the Taunton, Mass., company. One roll, with a 3 inch diameter, replaces an existing unit. The other, 5⅛ inches diameter, fills a demand too tough for a 4¼ inch roll but not calling for a 6¼ inch unit. In addition, Mount Hope announced improvements in design of components of the existing 4¼ inch model.

The 3 inch diameter ball-bearing Mount Hope Roll replaces the present bushing-type unit of that size. The ball bearing design is said to allow the roll to run at substantially greater speeds. The unit has a 1-5/16 inch axle and is provided with either plain or sealed ends.

The 3 inch diameter Mount Hope roll uses the same cap-type bracket as the present 4¼ inch diameter roll. It also incorporates several new designs, including an improved seal and sleeve holding device. These improvements will also be incorporated into Mount Hope's present 4¼ inch unit.

The 5⅛ inch diameter Mount Hope roll will make it possible to purchase a less expensive and smaller roll for jobs which previously would have required a 6¼ inch device. It will be available with a complete line of sheaves and brackets similar to those of the 6¼ inch roll.

Play It Smart!
Use Bitusize® "B" emulsified asphalt integral sizing to get high dry and wet strength in all your hard sized grades of board. Contact our office nearest you for complete information.
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320 Market St., San Francisco 20, Calif.
Perth Amboy, N. J.
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Atlanta 8, Ga.
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Inglewood, Calif.
Mobile, Ala.
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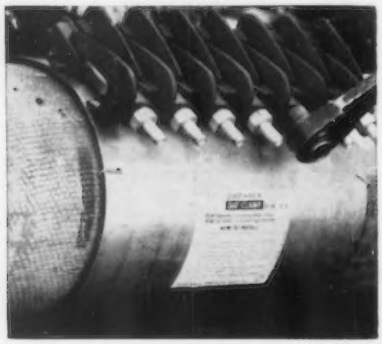
Bitumuls® Emulsified Asphalts • Chevron® Paving Asphalts
Laykold® Asphalt Specialties
SOAP CHIPS
V3c
DYNAMITE
Cola
V3s
BEER

Pipe Clamp Accommodates Misalignment and Deflection

A wrap-around pipe repair clamp featuring bolts on one side and a thick, butt-seal rubber gasket was announced by Dresser Manufacturing Division, Dresser Industries, Inc., Bradford, Pa.

To be marketed under the trademark "Dresser 360 All-Around



Clamp," the patented device provides a ⅜ inch adjustment on diameter so that a single clamp will fit a large number of pipe diameters. The clamp is used for the repair of cast-iron, asbestos-cement and steel pipes with diameters falling within the adjustment range of each clamp.

Designed for the repair of holes, circumferential breaks or splits in piping, the clamp may be used where pipe ends are deflected up to 4° or offset ⅛ inch. A sectional lug and the gasket design allow use of the clamp to join pipes of up to ¼ inch difference in outside diameter. An extra thick spanner plate supports the gasket so that pipes may be connected with as much as a one-inch gap between pipe ends.

The gasket has been engineered for automatic butting, and the joint molds to the pipe without crimping or flattening. No trimming of the gasket is required when being fitted,

PORTABLE RADIOMETER determines temperature variations as small as 1/20° F in moving or otherwise untouchable surfaces. Optical sensing head collects infrared energy emitted by all surfaces. Ten pound, battery powered instrument, indicates temperature on dial. Adaptable to operational control studies from below zero to 400° F. Williamson Development Co., Inc., 317 Main St., W. Concord, Mass.

and the gasket cannot pull apart on outsized and "out-of-round" pipe. The cloth-backed low durometer rubber used in the gasket has a uniform thickness of one-quarter inch.

The Style 360 is available in nominal sizes from 2 inches to 12 inches, fitting pipes with outside diameters from 2.38 inches to 14.50 inches. Clamp widths vary from 6 inches to 30 inches, making a total of 268 different models available.

Alarm System for Liquid Flow Control

From Terriss-Consolidated comes an alarm system for liquid flow control. This unit is primarily designed for use on automatic filling machines and is a device for sensing slowdown in pressure lines. Any failure in the supply immediately actuates an alarm bell which alerts the operator. Sani-

Key Chemicals from Wyandotte

caustic and chlorine for the North

Every railroad, highway, and seaway in the North leads to Wyandotte's plant on the hub of the Great Lakes . . . or to a strategically located storage point. Users pick their mode of shipment for its most economical cost and convenience. Big volume and long experience have made caustic and chlorine Key Chemicals at Wyandotte. That means made right . . . and shipped right for you. Let us serve you.

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"Paper conditioning the modern way"

BUILT TO OPERATE AT ANY MACHINE SPEED

SYSTEMS ALSO BUILT FOR APPLYING SIZING MATERIALS, STARCHES, WAX EMULSIONS, PLASTICIZERS AND OTHER SURFACE FINISHING SOLUTIONS.

BUILT FOR MANUFACTURING OR CONVERTING PROCESSES

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VAPO SYSTEMS

132 W. Home Avenue, Villa Park, Illinois

FIGHT CANCER WITH A CHECKUP
(See your doctor)
AND A CHECK
(Send it now)
TO

AMERICAN CANCER SOCIETY

tary construction is featured throughout with contact surfaces of stainless steel. The internal diaphragm is of neophrene. The Terriss System is also equipped with an auxiliary electrical outlet so that alarm bell extensions may be run to any part of the plant as additional alert stations. Terriss-Consolidated Industries, 22 Wooster St., New York 13, N. Y.

Automatic Carton Unloader Reduces Dry Material Handling

An automatic carton unloader, developed for handling semi-bulk quantities of diatomaceous earth and similar dry materials, cuts the cost of unloading operations by as much as 75 per cent says Vibra Screw Feeders Inc., Clifton, N. J. The portable unit can handle up to 100 lbs. per minute of material and feed it directly from the carton to the process.

The Vibra Screw Feeder is a fully enclosed machine that accepts a carton containing up to 1200 lbs., holds it firmly in place tilted at a 20° angle, punches two openings in the lower side, and then vibrates so that the dry material flows out in a continuous controlled stream. The rate of flow

is adjusted by a manually controlled gate that allows any rate from zero up to the feeder's full capacity. The unit is fully enclosed to eliminate any loss of material to surrounding areas. In addition, it is easily transportable by lift truck.

Johns-Manville has developed a carton that can be used with the automatic feeder or for manual unloading. The 54 x 40 x 60-in. carton holds up to 1200 lbs. of diatomite, as opposed to the 50-lb. bags in wide use. The cartons, which can be stacked three high, incorporate a self-contained pallet. Through operation of the carton unloader, dry materials can be unloaded directly into central slurry systems, batch tanks, or directly into grinders, beaters, or coating operations.

FUSION-BONDED PENTON-clad pipe and fittings provide corrosion protection from low temperatures to 250° F and above with mechanical stability and wear resistance. Available in standard 10-ft. lengths in 1½ through 24-inch diameters, Schedule 40 wall thickness, clad inside and outside with a .025-.035-inch protective film, including a complete line of elbows, tees, crosses, reducers and laterals. Other wall thicknesses and diameters can be produced on request. The Polymer Corp., Reading, Pa.

Laminating Adhesives for High Speed Operations

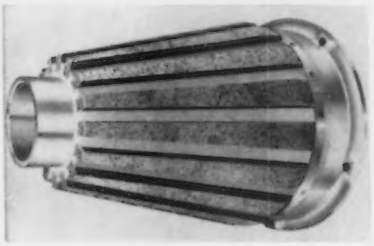
Resin adhesives for modern lining machines have been developed by Morningstar-Paisely's Adhesives Division.

Although resin adhesives for laminating cost more per pound, they are said to excel in production economics because of better coverage, lay-flat quality, strength of bond and machinability. A resin adhesive requires less production supervision; a proper bond can be expected each time, although the paper maker may have made changes in the surface coating or in the porosity of the board. Production losses, rejects, undelivered orders and waste are being kept to a minimum.

Morningstar-Paisley Resin Adhesives #65-1065 and #65-1338 are claimed to have all of these properties. They require no heat and afford fiber failure as laminated board and paper come off the machine. Further information can be obtained by writing Morningstar-Paisley, Inc., 630 West 51st Street, New York 19, N. Y.

Lava Tackle Developed For Morden Refiners

Development of a lava tackle for the Morden Stock-Maker refiners is announced by Morden vice president



in charge of sales and services, John L. Sigler. The fillings are recommended where maximum fiber development is required, as in the carbonizing, grease-proof and glassine field.

Production experience indicates that the Stock-Maker refiner with the lava tackle gives fiber treatment comparable to a conventional stone roll multiple-bedplate batch beater. These results are said to be obtained at relatively moderate capital costs and low energy requirements per ton of production. In addition, the Stock-Maker refiner provides continuous production.

The Morden Stock-Maker Refiner with lava rotor and Bidwell type shell liner has proven itself during many months of actual production. Lava against lava refining is now being evaluated under production conditions. Lava used in the Morden Stock-Maker fillings is highest grade basalt imported from West Germany. For detailed information write to Morden Machines Co., 3420 S. W. Macadam Avenue, Portland 1, Ore.

"I don't care if the baloney is for the office party—it gums up the cutter."

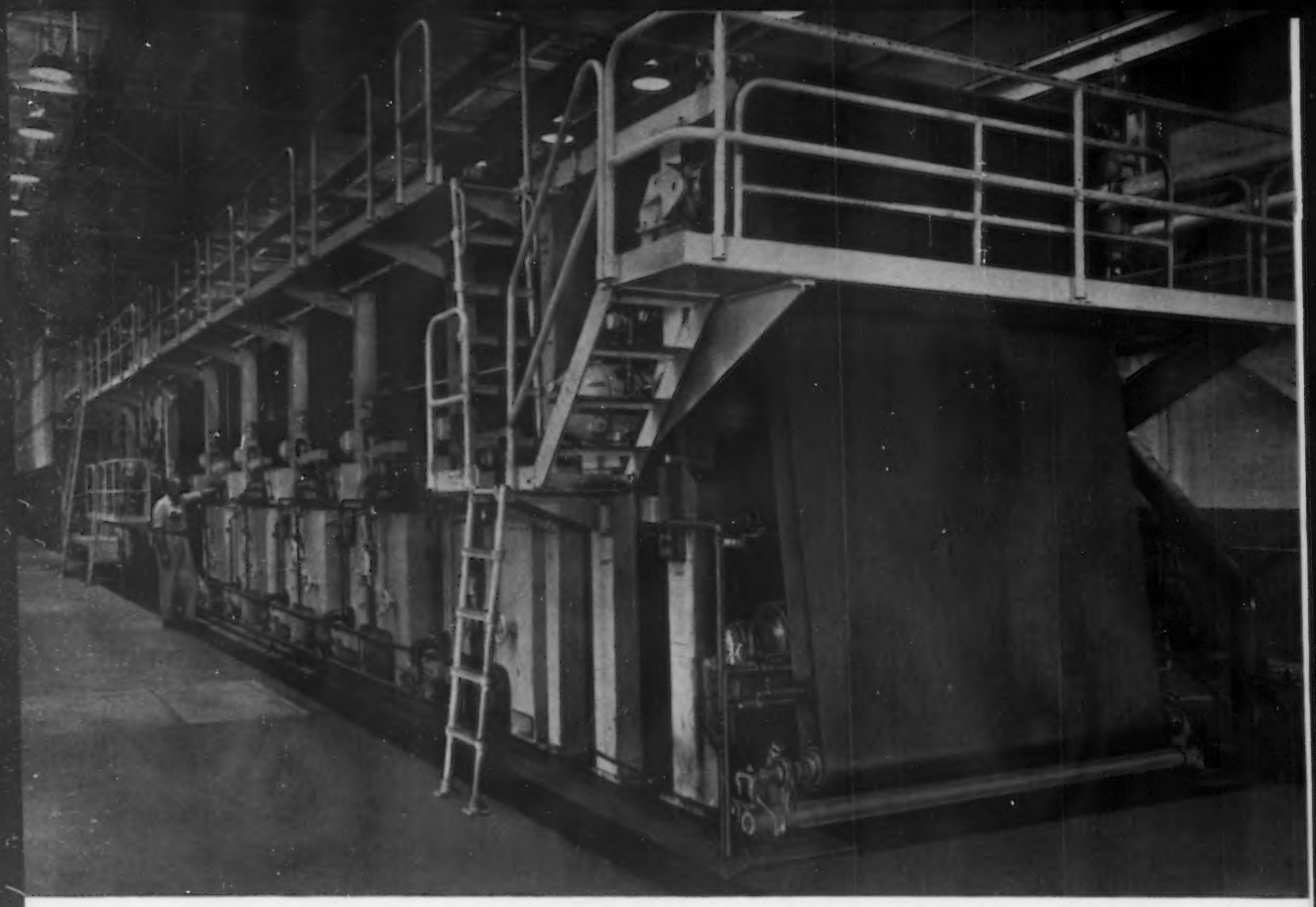
Key Chemicals from Wyandotte

caustic and chlorine for the South

By barge, rail, truck, or over the fence, Southern users can now draw on the capacity of Wyandotte's new Geismar plant. 335 tons of chlorine, 385 tons of caustic per day . . . produced with the same care that has made chlorine and caustic Key Chemicals at Wyandotte. We can ship economically and with dispatch. Which method of shipment is best for you?

WYANDOTTE CHEMICALS

MICHIGAN ALKALI DIVISION, WYANDOTTE, MICHIGAN



96", 5-cylinder Manchester paper machine now in operation at Case Brothers mill, Brattleboro, Vermont.

THIS MANCHESTER PAPER MACHINE IS THE HEART OF CASE BROTHERS NEW MODEL MILL

The Case Brothers model mill at Brattleboro, producing Genuine and Imitation Pressboard, is the first ever designed exclusively for the manufacture of pressboard products. The heart of this new mill is a special-performance, versatile paper machine that Manchester designed, engineered and built to the specifications of Case Brothers and their consulting engineer, Chas. T. Main, Inc., Boston, Mass.

The new 5-cylinder Manchester machine features an 8 to 1 speed range, permitting extreme versatility. It is designed to produce Genuine Pressboard, Imitation Pressboard and specialties. Provisions have been made for future expansion of the machine to 7 vats, and to double the production capacity. All 5 present vats are equipped with stainless steel taper flow inlets. Suction drum press, primary and main presses are pneumatically loaded.

To eliminate need for a floor pit, Manchester elevated the rebuilt two-high dryer section. Open side calenders provide air-over-hydraulic loading and electric lifting for precise pressure adjustments of all rolls in each stack. Other Manchester components include pneumatic, horizontal track reel, and air-controlled, 2-drum winder, equipped with hydraulic roll ejector and roll unloading table. A center flat belt, cone-pulley type machine drive—with steam turbine prime mover on the line shaft—is used.

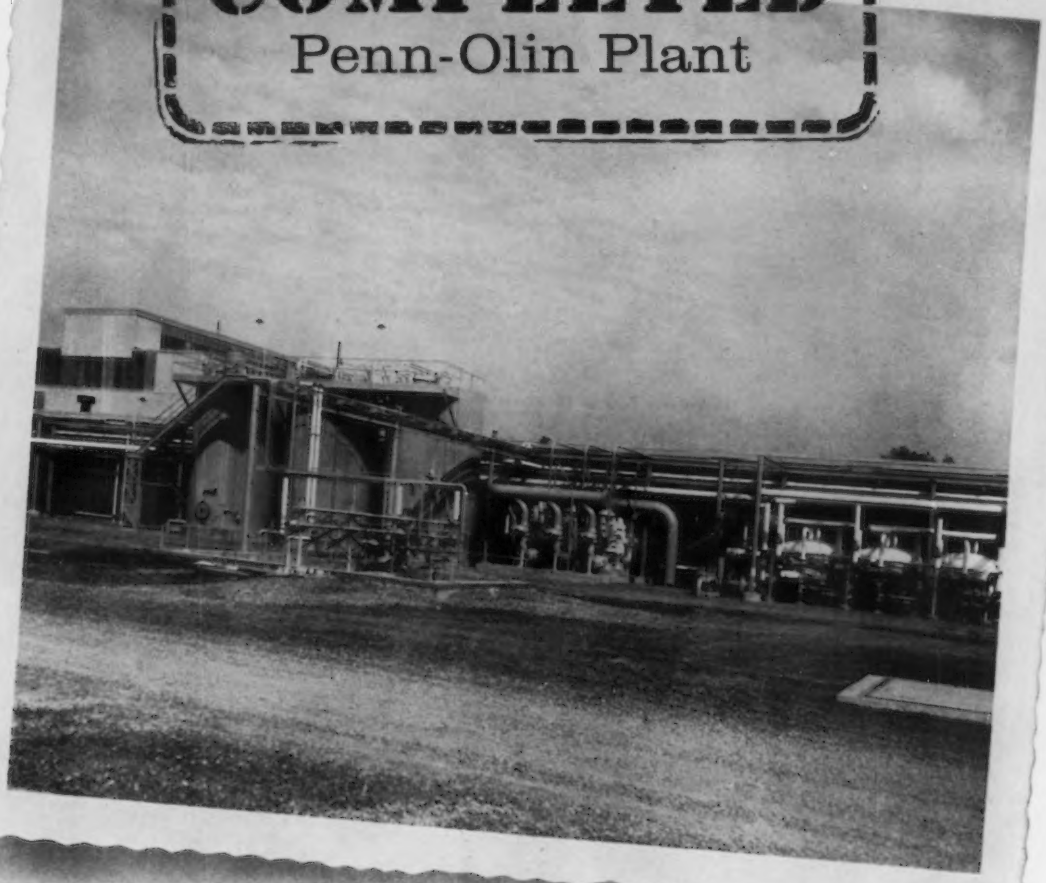
"Since start-up, the performance of our Manchester paper board machine has fully matched our expectations," reports Robert Case Dennison, Vice President—Production, Case Brothers, Inc. "It's doing the kind of job that we counted on in the planning of this new mill."

You, too, are assured of the profit-making machine installation you want when you call in the Man from Manchester. ~ ~ **THE MANCHESTER MACHINE COMPANY, MIDDLETOWN, OHIO.**

Manchester... profit builders for papermakers

THE MANCHESTER MACHINE COMPANY

COMPLETED
Penn-Olin Plant



ON STREAM...over 25,000 tons of new sodium chlorate capacity

Customers are now receiving shipments of highest quality sodium chlorate from Calvert City, Kentucky, in new rail equipment specifically designed for this service. Place your order now with Olin Mathieson for shipment, immediately or according to your schedule.

As in the past, industry can count on Olin Mathieson's technical experience and service in handling sodium chlorate.

For your chlorate requirements, call one of our district offices or OLIN MATHIESON, Baltimore 3, Maryland.

1682

CHEMICALS DIVISION **Olin**

Meet Huyck's

Marshall McKew

Marshall McKew is Huyck's Production Manager for Porosoft Needled Felts. A textile Engineer from Lowell Technological Institute, he has 15 years of manufacturing experience in both woven and needled textiles. Here at Huyck, his large production group employs the most modern equipment available built to our specifications.

Since purchasing the first wide needle loom used in the felt industry, Huyck has worked extensively on this new felt development. Marshall and his group draw heavily upon Huyck's background of needled felt experience and are constantly alert to improving all characteristics of Porosoft felts.

HUYCK FELTS

First in felts since 1870

CHAS. T. MAIN, INC.

ENGINEERS

PROCESS STUDIES, DESIGN, SPECIFICATIONS, CONSTRUCTION SUPERVISION

PULP AND PAPER MILLS

STEAM, HYDRAULIC AND ELECTRICAL ENGINEERING REPORTS, CONSULTATION, VALUATIONS

BOSTON, MASSACHUSETTS

CHARLOTTE, NORTH CAROLINA

Figures of the Week

PAPER PRODUCTION RATIO REPORT—American Paper & Pulp Assn. Figures

(Production as per cent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

	Sept. 30	Oct. 7	Oct. 14	Oct. 21	Oct. 28
1961	95.0r	92.9	95.1	93.2r	94.5
	Oct. 1	Oct. 8	Oct. 15	Oct. 22	Oct. 29
1960	95.5	93.6	95.3	94.5	95.8

r Revised.

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1960	96.5	97.7	98.1	96.9	97.6	96.1	81.2	91.7	89.1	94.8	92.0	80.2	92.7
1961	87.9	90.0	91.2	91.2	91.6	91.3	78.0	90.5	88.0‡	93.9‡			

‡ Preliminary.

COMPARATIVE YEARLY SUMMARIES

	1954	1955	1956	1957	1958	1959	1960	1961
Year to Date	91.8	96.1	98.5	91.3	86.9	92.6	94.0	89.2
Year Average	91.6	96.2	97.9	90.4	87.0	92.2	92.7	

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available.

PAPERBOARD OPERATING RATIOS†—National Paperboard Assn. Figures

COMPARATIVE WEEKLY SUMMARIES

	Sept. 30	Oct. 7	Oct. 14	Oct. 21	Oct. 28
1961	98	97	98	97	99
	Oct. 1	Oct. 8	Oct. 15	Oct. 22	Oct. 29
1960	93	92	94	93	91

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1960	92	95	94	93	94	92	78	94	88	93	86	73	89
1961	89	89	92	91	92	95	78	95	92				

† *Per cent of operation based on "inch-hours" reported on a 6-day basis to the National Paperboard Association.*

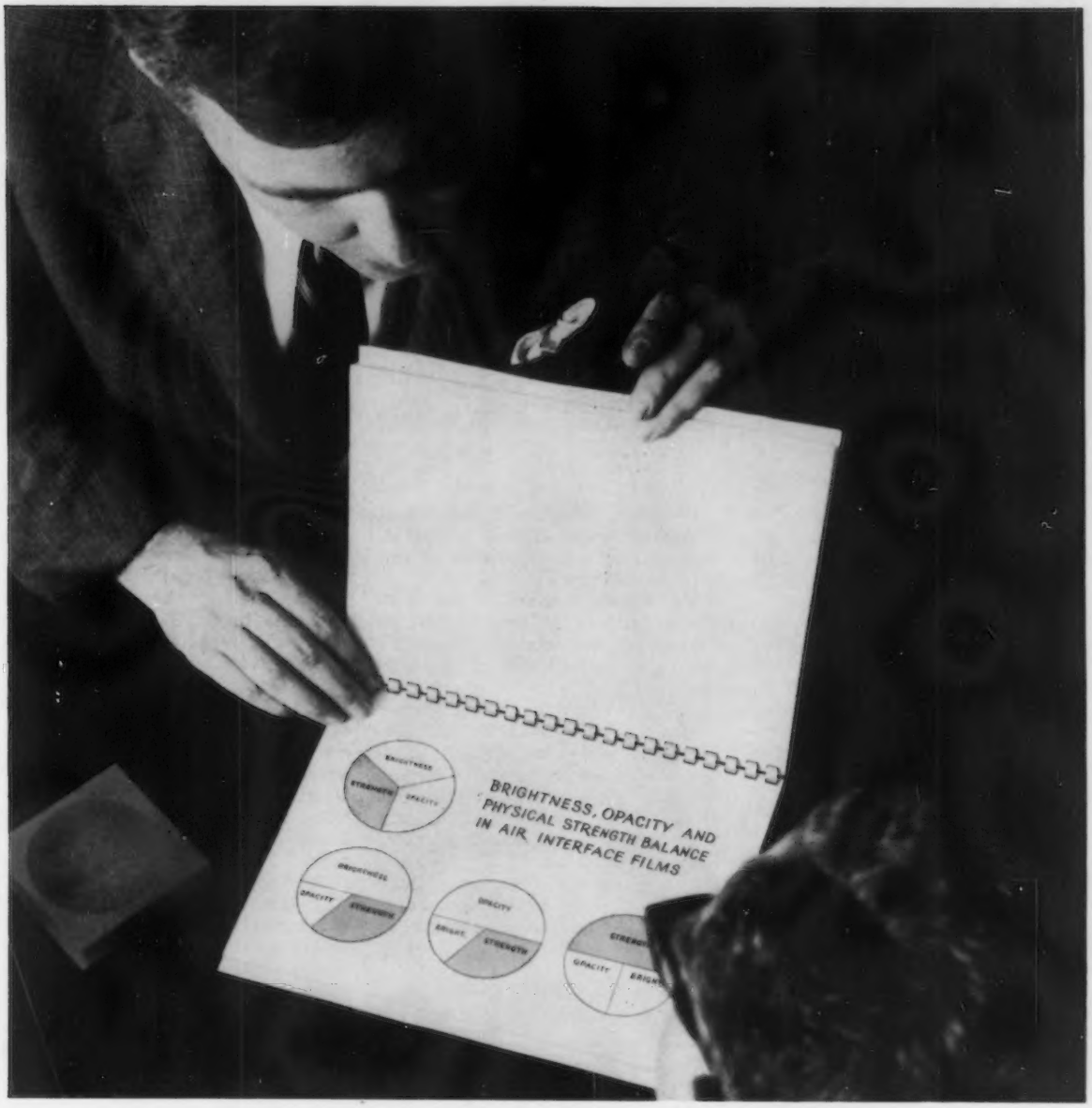
SUMMARY OF PAPERBOARD STATISTICS—National Paperboard Assn. Figures

ITEM	WEEK ENDING October 21, 1961	WEEK ENDING October 28, 1961	CUMULATIVE TO DATE January 1, 1961 to October 28, 1961
% Activity	97%	99%	91%
Total	355,206	356,111	13,666,334
Containerboard—Domestic Use	192,870	187,427	7,018,636
Liner	131,815	127,703	4,680,794
Corrugating Material	55,907	55,092	2,129,885
Chip & Filler Board	5,148	4,632	207,957
Boxboard—Domestic Use	98,716	104,676	4,124,467
Folding	57,235	63,801	2,461,673
Set-Up	10,680	10,858	403,458
Special Food Board	30,801	30,017	1,259,336
Other Paperboard	63,620	64,008	2,523,231
Containerboard Type	31,370	31,129	1,216,353
Boxboard Type	32,250	32,879	1,306,878
Total Orders			
Received	324,962	329,629	
Unfilled End of Week	551,042	521,854	

Knox Felts KNOX WOOLEN COMPANY

CAMDEN, MAINE

America's First Manufacturer of Endless Paper Machine Felts



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When you buy white pigments, you're buying opacity. But if your choice of pigments gives more opacity than you need or opacity at a sacrifice of brightness and strength—you're wasting money!

And here is where your Du Pont Pigments Representative can help you. He can draw upon the widest choice of pigments available to give you just the opacity you require, while maintaining all other desirable properties. Du Pont's broad line of "Ti-Pure" titanium dioxide pigments includes many new grades not available elsewhere—grades that were developed especially for the paper industry.

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BETTER THINGS FOR BETTER LIVING...*THROUGH CHEMISTRY*

PTJ NEWS OF SUPPLIERS

W. J. Woolley

T. A. Keating

H. A. Bernet

R. Woods

Henry Pratt Co., Chicago, has appointed W. J. Woolley vice president and general manager-Plate Division. The Plate Division manufactures specialty steel fabrications, blast valves for missile bases, papermaking machinery, and air locks for nuclear containment vessels.

Also announced is the appointment of Thomas A. Keating as application engineer. Mr. Keating was formerly with Republic Flow Meters in the same capacity.

Freeport Sulphur Co., New York, has elected Raymond H. Feierabend a vice president.

Mr. Feierabend will be responsible for the company's sulphur operations in Louisiana which include five mines currently producing at a rate in excess of 2,000,000 tons a year.

Minneapolis-Honeywell Regulator Co., has appointed Alonzo R. Parsons sales supervisor for scientific products in the Eastern region, embracing all of New England, most of New York state and northern New Jersey.

His responsibilities include marketing activities for instrumentation produced by five corporate divisions and including electronic medical systems, data handling and magnetic tape systems, and laboratory and test equipment.

Mr. Parsons, a graduate of the University of Pennsylvania, joined Honeywell in 1947 as an application engineer. Since 1950 he has served as a sales engineer, scientific instrumentation specialist and regional training director in the New York office.

Webster Manufacturing, Inc., Tiffin, Ohio, has elected Hubert A. Bernet, Jr., to the position of vice president—sales.

Mr. Bernet's newly-created position is part of an overall move to consolidate and intensify Webster's activity in the bulk material handling field.

Morey Paper Mill Supply Co., Fitchburg, Mass., has appointed Rodney Woods as its Southern Representative. He will handle the several Morey lines, including Fitchburg Screen Plates, National Perforated Screen Plates for centrifugal and pressure screens, Samson "Quik-Splice" Carrier Rope, Shelley Paper Machine Aprons and Deckles, and other paper mill supplies carried by Morey.

Mr. Woods spent several years selling rubber covered rolls and mechanical rubber products to southern pulp and paper mills.

Buckeye Cellulose Corp., Memphis, Tenn., announced price increases November 1 of $13 per short ton for all cotton linter pulps and papers. The increase is effective immediately and is necessitated by an increase in second-cut lint price. As a stabilizing influence on pulp prices, Buckeye states that only about half of the increase in cost of raw material is reflected in the amount of their pulp price increase.

Witco Chemical Co., Inc., has appointed Harry R. Bornscheur as general sales manager of its Pioneer Products Division and Joseph Puntigam as the division's eastern district sales manager. In his new post, Mr. Bornscheur is responsible for Pioneer's national sales and for the coordination of new-product merchandising in the protective coating field. Mr. Puntigam is now responsible for the sales of Pioneer accounts in the eastern sales territory and reports to the division's general sales manager.

The Lawson Co., division of Miehle-Goss-Dexter, Inc., has signed a contract authorizing the Canadian firm of R. McDougall Co., division of Upton, Bradern, and James, Ltd., Galt, Ont., to manufacture the new Lawson Pacemaker II paper trimmers.

At the contract signing, E. M. Abrams, president of Lawson, emphasized that the manufacturing economies resulting from the unique U. S.-Canadian venture will enable Lawson to offer the Pacemaker II cutters throughout North America

and the world, at prices to compete with quality cutters made anywhere.

The new Lawson Pacemaker II line will be made available in 42, 47, 52 and 56 inch sizes. The standard Pacemaker machines in larger sizes will continue to be produced at the company's Chicago plant.

F. C. Goodwill

D. J. Nixon

Beloit Iron Works has announced that Fred C. Goodwill, formerly manager of St. Regis Paper Co.'s Bucksport, Me., mill, has joined Beloit as a coating consultant. Mr. Goodwill will be working closely with Beloit's sales, engineering and research departments, consulting with mills on coating applications and processes.

Geigy Dyestuffs, Division of Geigy Chemical Corp., Ardsley, N. Y., announces the appointment of Dudley J. Nixon as assistant director, Paper Department. He will assist S. S. Harkavy, director, Paper Department, in directing dyestuff and chemical sales and technical service activities to the paper, pulp and converting industries in the United States and Canada.

In addition to his new responsibilities, Mr. Nixon will continue to personally service the mid-Atlantic states assigned to him since 1951. He joined Geigy Dyestuffs in 1946, serving first for two years in the Products Dept., and then three years in the Technical Service Laboratories prior to entering technical sales.

J. M. Huber Corp. is increasing the capacity of the chemicals plant at Havre de Grace, Md. The current construction will provide for additional production of Huber's sodium silico aluminate "Zeolex" and also provide for a new Huber product, an improved hydrated silicic acid pigment.

The hydrated silicic acid pigment is an outgrowth of original work of the company performed many years ago. The quality control features designed into the new plant are expected to ensure an extremely well-controlled uniformity, which should make this a highly desirable product for use in the rubber, paper, pesticides, and paint markets.

Production from the new facilities is expected about mid-1962.

Walworth Co. has announced the appointment of John W. Collins as president of Walworth.

Mr. Collins, president of Walworth's subsidiary, Grove Valve & Regulator Co., Oakland, Calif., will assume his new duties as Walworth president immediately. He will be headquartered at the Walworth offices, 750 Third Avenue, New York, N. Y. In addition to his new office, Mr. Collins will continue as president of Grove.

During his 18 years service with Grove, Mr. Collins was treasurer, senior vice president and then president of the West Coast based manufacturer of valves and pressure regulators. Grove products are sold to the petroleum, petrochemical, and aerospace industries.

J. W. Collins

R. J. Kneeland

John W. Bolton & Sons, Inc., and The Emerson Manufacturing Co. Division has named R. Joseph Kneeland sales engineer. He is covering the New England Territory.

Mr. Kneeland's background and experience in the paper industry include several years spent as process engineer at Gilman Paper Co. Gilman, Vt., and before that he was assistant product development engineer at West Virginia Pulp and Paper Co.'s Mechanicsville, N. Y., mill. He is a graduate of the University of Maine with a B.S. degree in chemical engineering.

John A. Kenyon has been promoted to plant superintendent of John W. Bolton & Sons, Inc.

Mr. Kenyon joined the Lawrence, Mass., manufacturer of machine knives and stock preparation equipment as a machine operator in 1951. Several previous promotions moved him up to the rank of foreman, a position he occupied until this advancement. He holds a B.B.A. degree in engineering and manage-

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OVER and

OVER and

OVER again...

Make a trial sheet, weigh it, set the proportioner to that weight — and you're in business!

In 7 minutes, you'll get absolutely uniform test sheets, one after another, from your pulp sample. No charts, no calculations necessary.

That's just **one** reason why the Noble & Wood Laboratory Sheet Machine is standard equipment throughout the world. Beats anything else there is for speed, accuracy, lifetime reliability.

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NOBLE & WOOD MACHINE COMPANY

Paper Mill Machinery

Hoosick Falls, New York, U.S.A.

NOBLE & WOOD ACCEPTS A NEW CHALLENGE ENTHUSIASTICALLY, LED BY A VIGOROUS NEW MANAGEMENT TEAM AND BACKED BY 67 YEARS OF SUCCESSFUL EXPERIENCE

ment and an associate degree in mechanical engineering from Northeastern University.

Stein, Hall & Co., New York, N. Y., has announced the appointment of David C. Booth as sales manager for "Flash Seal." Mr. Booth will develop and promote sales with banks department stores, utilities, stationers, insurance companies, mailing houses, virtually anyone who stores and uses envelopes in large quantities, for the revolutionary new envelope adhesive—particularly in the area of New York, Boston and Washington, D. C.

Mr. Booth, a graduate of Muhlenberg College, was formerly vice president of the Samuel Cupples Envelope Co. of Brooklyn, with which he was associated for 25 years.

Stein, Hall is a manufacturer of chemical specialty items. Resistance of Flash Seal, the new adhesive, to heat and humidity, it is claimed, allows envelopes to remain flat no matter how long they are stored and to feed perfectly in printing, inserting and mailing machines. Stein, Hall has offices in 13 cities throughout the United States, as well as Montreal and Toronto, Canada, South Africa, The Netherlands, India, Thailand and Switzerland.

D. C. Booth

A. M. Andrews

Air Reduction Co., Inc., has appointed A. M. Andrews, Jr., president of Airco Company International, Mr. Andrews succeeds J. G. Bell, who is retiring.

As president, Mr. Andrews will be responsible for the sale and distribution of Air Reduction products in more than 65 foreign countries. A graduate of New York University with a degree in international marketing, Mr. Andrews attended St. Andrew's Prep in Middletown, Del. He has been associated with Airco since 1944.

Mr. Andrews started in the Export Department of Air Reduction Sales Co. When the department was formed into a separate division in 1945, he was appointed an assistant to the vice president in charge of sales. Four years later he became sales manager, a position he held until his most recent promotion.

Airco Company International, a division of Air Reduction Co., Inc., is responsible for the overseas marketing of the company's welding and cutting products, industrial and medical gases, hospital equipment and acetylenic chemicals, with headquarters located at 150 East 42nd Street, New York 17, N. Y.

General Aniline & Film Corp. has announced that it will spend between $10,000,000 and $15,000,000 for the expansion of its chlorine-caustic soda manufacturing facilities at its Linden, N. J., plant to meet the growing market in the Northeast section of the country.

Harold G. Shelton, vice president of the company and in charge of its chemical divisions, said in making the announcement that the major construction contract has been awarded to Vickers Krebs, Ltd., of Montreal, and construction will begin early in December with completion scheduled for early in 1963.

"The expansion project," he said, "will increase our chlorine capacity from 50 to 230 tons per day and the completed facility will be the largest producer of the product in New Jer-

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SALES OFFICE: 250 PARK AVENUE, NEW YORK 17, NEW YORK • YU-KON 6-7840

sey, the New York metropolitan area, and all of New England."

The company's Antara Chemicals Division will operate the plant and market the production.

Joseph T. Ryerson & Son, Inc., has appointed William J. Kotowicz manager of aluminum sales at the Houston, Tex., plant. Previously he had been a field representative responsible for the sale of the company's full line of steel, aluminum, industrial plastics and metal fabricating machinery.

A resident of Houston since 1946, Mr. Kotowicz became associated with the Vinson Steel and Aluminum Co. in 1957. When this firm was acquired by Ryerson in 1958, he continued in the same capacity with the new owner.

Allis-Chalmers Manufacturing Co., Milwaukee, Wis., has appointed R. E. Goodwill sales manager, Norwood (Ohio) Works electrical department, succeeding J. F. Fenske who becomes manager, motor sales, Pacific Region.

Mr. Goodwill had been manager, Industrial Equipment Div., sales, Central Region, since 1959 with headquarters in Cleveland. He has been with Allis-Chalmers since 1954 and is a graduate engineer of Michigan State College.

Mr. Fenske was manager of industrial sales in Norwood Works electrical department before being named manager of electrical department sales about a year ago. He joined Allis-Chalmers in 1948 and is a graduate engineer of the University of Cincinnati.

In his new position, Mr. Fenske will headquarter in the San Francisco office.

Chicago Bridge & Iron Co., world wide steel plate fabricating and construction firm, has appointed R. W. Warren as manager of sales for Germany, Holland and Italy.

Mr. Warren, formerly of CB&I's foreign sales department in New York, initially will be located in The Hague, Holland, and later will establish his office in Germany.

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Groundwood	$82.50/ 90.00	$82.50/ 90.00	$90.00/ —	$90.00/ —	$90.00/ —
Bleached Gw'd.	97.50/100.00	97.50/100.00			
Kraft, Blchd.	‡140.00/150.00	‡140.00/150.00	150.00/ —	150.00/ —	150.00/ —
Kraft, Blchd. Hdwd.	135.00/140.00		140.00/ —		
Kraft, Semi-bleached.	130.00/140.00				
Kraft, Unbl.	117.50/125.00	125.00/ —	125.00/130.00	125.00/ —	
Sulphite, Blchd.	‡135.00/140.00	‡135.00/140.00	140.00/ —	140.00/ —	140.00/ —
Sulphite, Bl. Hdwd.	135.00/ —				
Sulphite, Unblchd.	125.00/ —	125.00/ —	125.00/ —	125.00/ —	125.00/ —
Sulphite, Unb'l. Gl'an.		140.00/ —	134.00/ —		
Soda, Blchd.	130.00/135.00	130.00/135.00			

‡ Depending on Brightness.

COTTON LINTERS

F.O.B. OIL MILLS PER CWT

WEEK ENDED OCTOBER 31

	Atlanta	Memphis	Dallas	Los Angeles
Grade 1	n.a.	n.a.	n.a.	n.a.
2	$8.00/7.75	n.a.	n.a.	$7.75/ —
3	7.75/7.25	$8.25/7.25	$7.50/7.00	7.25/7.00
4	7.25/6.75	7.00/6.75	6.50/6.25	6.75/6.50
5	6.75/6.25	6.50/6.25	6.00/5.50	6.00/5.75
6	6.25/5.85	6.00/ —	5.25/5.00	5.50/5.25
7	5.85/5.50	6.00/ —	4.75/4.00	n.a.

WASTE PAPER MARKET

Mill Prices, f.o.b. Trucks Shipping Point — Includes Brokerage

These quotations are a partial indication of the price range on volume tonnage in each market on the date specified, as gathered from major dealers and brokers. SPECIAL PACKINGS AND SPOT TONNAGE NOT INCLUDED. Prices nominal.

	New York	Boston	Chicago	Los Angeles
	November 6	November 6	November	November
No. 1 Mixed Paper	$ 12.00/ 13.00	7.00/ 10.00	6.00/ —	12.00/ —
No. 1 News	16.00/ 18.00	11.00/ 14.00	16.00/ —	15.00/ —
Overissue News (Lg. size)	21.00/ 24.00	12.00/ 14.00	21.00/ —	18.00/ —
Mill Wrappers	19.00/ 22.00	10.00/ 12.00	11.00/ —	13.00/ —
Old Corrugated Containers	22.00/ 25.00	18.00/ 18.50	20.00/ —	16.00/ —
Super Resorted Kraft Paper	35.00/ 40.00	— / —	30.00/ —	50.00/ —
New Double Kr. Ld. Corr. Cuts	30.00/ 32.50	30.00/ 32.50	32.50/ —	27.50/ —
(Semi-chem. medium)	45.00/ —	40.00/ 45.00	42.50/ —	— / —
New 100% Kraft Corr. Cuts	42.50/ 47.50	— / —	50.00/ —	— / —
New Br. Kraft, Env. Cuts	65.00/ 70.00	65.00/ 75.00	45.00/ —	37.50/ 40.00
New Br. Kr. Bag Waste Prntd.	50.00/ 55.00	50.00/ 60.00	45.00/ —	35.00/ —
New Br. Kr. Bag Waste Unprintd.	55.00/ 60.00	60.00/ 65.00	55.00/ —	45.00/ 47.50
No. 1 Groundwood Shvs.	30.00/ 35.00	20.00/ 25.00	15.00/ —	25.00/ —
White Newsblanks	50.00/ 55.00	40.00/ 45.00	30.00/ —	55.00/ —
No. 1 Soft White Shvs.	60.00/ 65.00	55.00/ 65.00	50.00/ —	75.00/ —
Super Soft White Shvs.	65.00/ 75.00	70.00/ 80.00	60.00/ —	— / —
Hd. White Shvs.	85.00/ 90.00	80.00/ 90.00	75.00/ —	80.00/ —
Hd. White Env. Cuts	95.00/100.00	100.00/105.00	80.00/ —	103.00/ —
Col. Tab. Cards	50.00/ 55.00	54.50/ 59.50	47.50/ —	35.00/ —
Manila Tab. Cards	72.50/ 75.00	67.50/ 72.50	70.00/ —	75.00/ —
No. 1 Col. Ledger	35.00/ 40.00	32.50/ 35.00	40.00/ —	23.00/ —
White Ledger	55.00/ 57.50	50.00/ 55.00	50.00/ —	40.00/ 45.00
Mixed Book & Mag.†	14.00/ 15.00	— / —	8.00/ —	/ —
No. 1 Books‡	15.00/ 20.00	18.00/ 22.00	22.50/ —	8.00/ 12.00

† Includes Time & Life; no coarse groundwood. ‡ Not to exceed 10% of groundwood.

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Wax Emulsions—Widest range, ready to use, noted for clarity, stability and brightness. Emulsions also "made-to-order".

Dry Asphalt Size—Unique, finely powdered product, readily mixed, adds water resistance, increases strengths.

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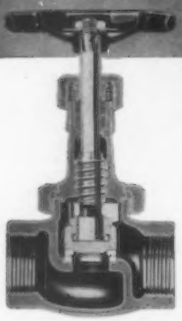

200 lb. S. P. 400 lb. W. O. G.
150 lb. S. P. 300 lb. W. O. G.

One look at the precision-machined alloys in the LQ-600 Valve helps explain its maintenance-saving performance. Seats and discs are made of Brinalloy®. Add Stemalloy®, the most durable stem material ever put into a valve, and you have the two big reasons why LQ-600's are setting new standards of performance everywhere they are installed.

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Exclusive Lunkenheimer alloy that actually outwears 500 Brinell Stainless Steel or Case-Hardened Stainless exceeding 1000 Brinell.

*Patented alloy

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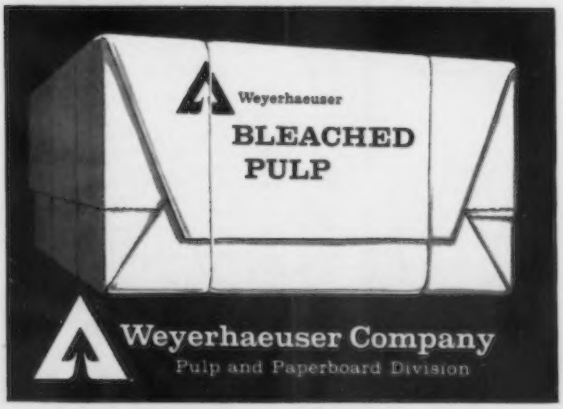

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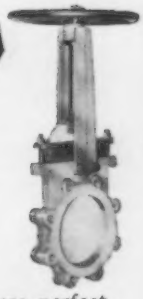

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1—Simplex #7 & 1—#24 Pouch Machines with Elec. Eye
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1—Nasko F & S Bag Machine Range 2-10"W & 3½ x 18"L.
1—Hansel F & S Bag Mach.—3 color Printer
1—#2 Lockport F & S Plus Range 3—12 lbs.
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1—#26 Matador F&S Bag Machine
2—Roto Model "C"

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1—24" International 2-P Waxer
1—42" Reverse Roll Coaters
4—Hayssen 4 & 6 Roll Wrappers
1—84" Hamblet Sheeter w/Erie Layboy
5—Hamblets 100-76-72-64-60 W/Layboy
1—80" Hamblet Duplex W/Layboy
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1—115″ B-C 7 roll
1—124″ Downingtown 5 roll
1—124″ Downingtown 6 roll
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1—Single cylinder; 99″ face x 48″ dia.
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2— 44″ face; 2—46″ face
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11— 72″ face w/gears & bearings
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26— 76″ face; complete section
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2— 77″ face w/gears & bearings
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2— 80″ face
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9— 84″ face; complete section
91— 86″ face; complete sections
7— 92″ face; complete section
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24— 96″ face w/gears, frames & bearings
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48″ Dia.:
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12— 82″ face; complete section
3— 84″ face
7— 94″ face
1— 96″ face
12— 98″ face—complete section
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6—110″ face w/gears & bearings
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1—E. D. Jones #4 Imperial A.F. Brng.
4—Noble & Wood Monarch

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1—123″ Beloit—2 bowl
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1—146″ B & S pope type w/Reliance drive

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2— 42 Cameron Type 26-2A
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2— 62″ Cameron Type 6
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36″ Maximum Rewind Diameter
1— 82″ Cameron—Model 10-10
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1— 82″ Johnstone, Model 16; A-F Brng.
1—136″ Cameron Type 18; A-F Brng.
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1—152″ Langston Shear Cut
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1— 90″ Langston Shear Cut; A-F Brng.
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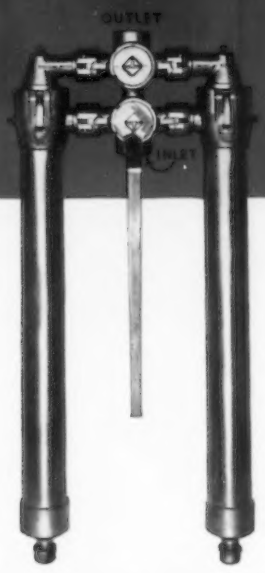

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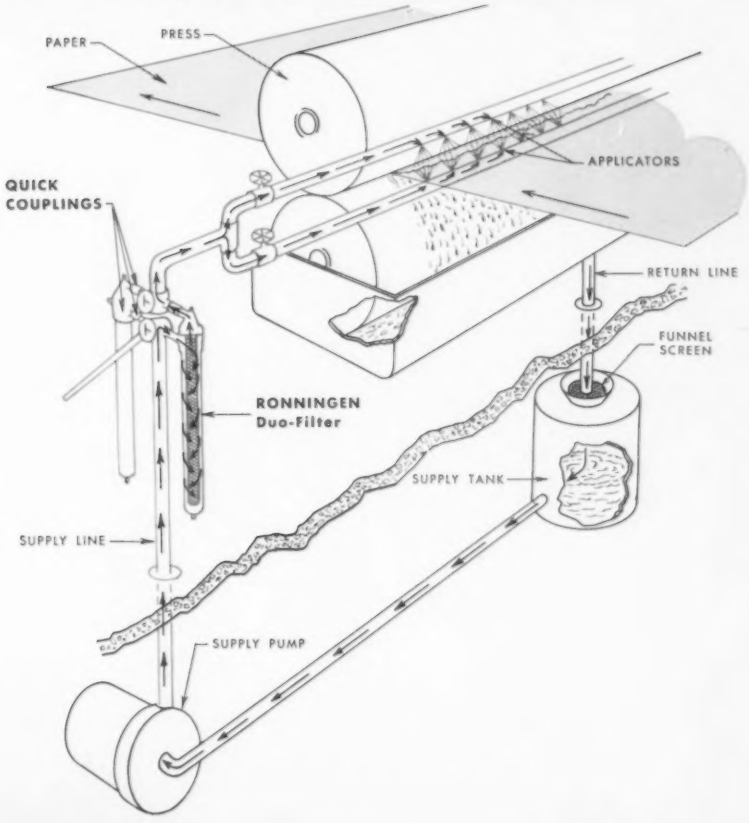

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